

CURRICULUM VITAE

Lindsey Jane du Toit

Ph.D., 1998, University of Illinois at Urbana-Champaign, USA

M.Sc., 1995, University of Illinois at Urbana-Champaign, USA

B.Sc. Honours, 1992, University of Natal - Pietermaritzburg, South Africa

B.Sc., 1991, University of Natal - Pietermaritzburg, South Africa

TERTIARY EDUCATION

University of Illinois at Urbana-Champaign (UIUC), USA (1992-1998):
Ph.D. (Plant Pathology) (1998)
M.S. (Plant Pathology) (1995)
University of Natal, Pietermaritzburg (UNP), South Africa (1988-1991):
B.Sc. Honors (Plant Pathology) (1991)
B.Sc. *cum laude* (Microbiology and Plant Pathology) (1990)

EMPLOYMENT HISTORY

Since Jul. 2013 Professor (60% research + 10% teaching) and Extension Specialist E4 (30%), Washington State University Mount Vernon Northwestern Washington Research & Extension Center (WSU Mount Vernon NWREC), and WSU Dept. of Plant Pathology. Responsibility for a state-wide research & extension program on diseases affecting high-value, small-seeded vegetable seed crops grown in the Pacific Northwest USA. These seed crops produce 50-100% of the US supply and up to 50% of the world supply of seed for >30 species of vegetables. This program investigates the biology, epidemiology, & management of seed crop diseases, and serves as a research-based resource on disease management for the scientific community and the regional, national, and international seed industry.

Aug. 2010-Jun. 2013 Associate Professor (60% research + 10% teaching) and Extension Specialist E3 (30%), WSU Mount Vernon NWREC and WSU Dept. of Plant Pathology.

Jul. 2006–Aug. 2010 Associate Scientist (60% research) and Extension Specialist E3 (40%), WSU Mount Vernon NWREC. Appointed to WSU Graduate Faculty in 2003.

Aug. 2000–Jun. 2006 Assistant Scientist (60%) and Extension Specialist E2 (40%), WSU Mount Vernon NWREC.

Since May 2012 Special Graduate Faculty, Department of Plant Agriculture, University of Guelph, Ontario, Canada

Oct. 2011-Sep. 2014 Associate Professor Extraordinary, Dept. of Plant Pathology, University of Stellenbosch, Stellenbosch, South Africa.

2009-2012 Adjunct Faculty, Department of Plant Pathology, University of Arkansas, Dale Bumpers - College of Agricultural, Food & Life Sciences, Fayetteville, AR.

Jun. 1998–Jul. 2000 Plant Diagnostician, WSU-Puyallup Plant & Insect Diagnostic Laboratory.

1993-1997 UIUC Plant Clinic - Assistant Disease Diagnostician.

1995-1998 Research Assistant for Prof. J.K. Pataky, sweet corn pathologist/epidemiologist, UIUC.

1992-1994 Research Assistant for Associate Prof. H.W. Kirby, field crops pathologist, UIUC.

Dec. 1991, Feb.-Apr. 1992 Farmers' Support Group, extension organization of UNP, South Africa - Assistant Researcher for *Plant Disease Handbook*.

PAPERS PUBLISHED

* indicates senior authorship or senior co-authorship.

1) Developed the initial idea, 2) obtained or provided funds or other resources, 3) collected data, 4) analyzed data, 5) wrote/created product, 6) edited product. Documented primarily for peer-reviewed research manuscripts.

Professional articles, refereed (68 total)

2017 (5) * Gatch, E.W., and du Toit, L.J. 2017. Limestone-mediated suppression of Fusarium wilt in spinach seed crops. *Plant Disease* 101:81-94. (1,2,3,4,5,6)

* Econopouly, B.F., Derie, M.L., Jones, S.S., and du Toit, L.J. 2017. Downy mildew of buckwheat, *Fagopyrum esculentum*, in the USA caused by *Peronospora* cf. *documetii*. *Plant Disease* 101:391. (1,2,3,4,5,6) <http://dx.doi.org/10.1094/PDIS-09-16-1362-PDN>

Moloto, V.M., Goszczynska, T., du Toit, L.J., and Coutinho, T.A. 2017. A new pathovar of *Pseudomonas syringae*, pathovar *allii*, isolated from onion plants exhibiting symptoms of blight. *European Journal of Plant Pathology* 146:591-603. (6)

* Paulitz, T.C., Knerr, A.J., Carmody, S.M., Schlatter, D., Sowers, K., Derie, M.L., and du Toit, L.J. 2017. First report of *Leptosphaeria maculans* and *Leptosphaeria biglobosa*, causal agents of blackleg, on canola in Washington State. *Plant Disease* 101:504. (2,3,4,5,6) <http://dx.doi.org/10.1094/PDIS-08-16-1108-PDN>

- Simon, P.W., Navazio, J.P., Colley, M., McCluskey, C., Zystro, J., Hoagland, L., Roberts, P.A., du Toit, L.J., Waters, T., Silva, E., Colquhoun, J., and Nunez, J. 2017. The CIOA (Carrot Improvement for Organic Agriculture) Project: Location, cropping system, and genetic background influence carrot performance, including top height and flavor. *Acta Horticulturae: in press*. (3,6)
- 2016 (2) * Alcalá, A.C., Paulitz, T.C., Schroeder, K.L., Porter, L.D., Derie, M.L., and du Toit, L.J. 2016. *Pythium* species associated with damping-off of pea in certified organic fields in the Columbia Basin of central Washington. *Plant Disease* 100:916-925. (1,2,3,4,5,6)
- * Sharma-Poudyal, D., Paulitz, T.C., and du Toit, L.J. 2016. Timing of glyphosate applications to wheat cover crops to reduce onion stunting caused by *Rhizoctonia solani*. *Plant Disease* 100:1474-1481. (1,2,3,4,5,6) *Monthly 'Editor's Pick'*.
- 2015 (6) Bull, C.T., Ortiz-Lytle, M.C., Ibarra, A.G., du Toit, L.J., and Reynolds, G. 2015. First report of bacterial blight of crucifers caused by *Pseudomonas cannabina* pv. *alisalensis* in Minnesota on arugula (*Eruca vesicaria* subsp. *sativa*). *Plant Disease* 99:415. (1,6)
- * Christianson, C.E., Jones, S.S., and du Toit, L.J. 2015. Screening carrot germplasm for resistance to *Xanthomonas hortorum* pv. *carotae*. *HortScience* 50:341-350. (1,2,3,4,5,6)
- * Gatch, E.W., and du Toit, L.J. 2015. A soil bioassay for predicting the risk of spinach Fusarium wilt. *Plant Disease* 99:512-526. (1,2,3,4,5,6)
- * Sharma-Poudyal, D., Paulitz, T.C., and du Toit, L.J. 2015. Evaluation of onion genotypes for resistance to stunting caused by *Rhizoctonia solani* AG 8. *HortScience* 50:551-554. (1,2,3,4,5,6)
- * Sharma-Poudyal, D., Paulitz, T.C., and du Toit, L.J. 2015. Stunted patches in onion bulb crops in Oregon and Washington: Etiology and yield loss. *Plant Disease* 99:648-658. (1,2,3,4,5,6)
- * Sharma-Poudyal, D., Paulitz, T.C., Porter, L.D., and du Toit, L.J. 2015. Characterization and pathogenicity of *Rhizoctonia* and *Rhizoctonia*-like species from pea crops in the Columbia Basin of Oregon and Washington. *Plant Disease* 99:604-613. (1,2,3,4,5,6)
- 2014 (5) * du Toit, L.J., and Derie, M.L. 2014. White rust of *Echinacea angustifolia* and *E. purpurea* in North America caused by a *Pustula* species. *Plant Disease* 98:856. (1,2,3,4,5,6)
- * du Toit, L.J., Derie, M.L., and Alcalá, A.C. 2014. First report of *Pythium sulcatum* causing cavity spot in processing carrot crops in the Columbia Basin of Washington State. *Plant Disease* 98:427. (1,2,3,4,5,6)
- * du Toit, L.J., Derie, M.L., Christianson, C.E., Hoagland, L., and Simon, P. 2014. First report of bacterial blight of carrot in Indiana caused by *Xanthomonas hortorum* pv. *carotae*. *Plant Disease* 98:685. (1,2,3,4,5,6)
- * Feng, C., Mansouri, S., Bluhm, B. H., du Toit, L.J., and Correll, J.C. 2014. Multiplex real-time PCR assays for detection of spinach seedborne pathogens. *Journal of Applied Microbiology* 117:472-484. (2,3,6)
- Schwartz, H.F., Alston, D., Alwang, J., Bartolo, M., Blunt, T., Boateng, C.O., Bunn, B., Cramer, C., Cranshaw, W., Davidson, J., Derie, M., Doran, J., Douce, K., Drost, D., du Toit, L.J., Gourd, T., Gugino, B., Hammon, B., Hardin, J., Hausbeck, M., Jibilian, G., Lafferty, J., LaForest, J., McMillan, M.S., Mohan, S.K., Morrice, J., Nault, B., Nischwitz, C., Norton, G., Otto, K., Pappu, H.R., Peterson, M., Sampangi, R., Schroeder, B., Secor, W., Szostek, S., Tisserat, N., Uchanski, M., VanKirk, J., Waters, T., Wiriyajitsomboon, P., and Wohleb, C. 2014. Onion ipmPIPE: A coordinated effort to improve the management of onion thrips and IYSV for onion growers and their industry. *Plant Health Progress* 15:172-183. (3,4,6)
- 2013 (4) * Iglesias-García, A.M., Villarroel-Zeballos, M.I., Feng, C., du Toit, L.J., and Correll, J.C. 2013. Pathogenicity, virulence, and vegetative compatibility grouping of *Verticillium* isolates from spinach seed. *Plant Disease* 97:1457-1469. (1,2,3,6)
- * Okubara, P., Harrison, L.A., Gatch, E.W., Schroeder, K., Vandemark, G., and du Toit, L.J. 2013. Development and evaluation of a TaqMan real-time PCR assay for *Fusarium oxysporum* f. sp. *spinaciae*. *Plant Disease* 97:927-937. (1,2,3,4,5,6)
- * Patzek, L.J., du Toit, L.J., Paulitz, T.C., and Jones, S.S. 2013. Stunting of onion caused by *Rhizoctonia* spp. isolated from the Columbia Basin of Washington and Oregon. *Plant Disease* 97:1626-1635. (1,4,6)
- * Temple, T., du Toit, L.J., Derie, M.L., and Johnson, K. 2013. Quantitative molecular detection of *Xanthomonas hortorum* pv. *carotae* in carrot seed before and after hot water treatment. *Plant Disease* 97:1585-1592. (1,2,3,4,5,6)
- 2012 (5) * du Toit, L.J., and Derie, M.L. 2012. First report of Cladosporium leaf spot of spinach caused by *Cladosporium variabile* in the winter spinach production region of California and Arizona. *Plant*

- Disease 96:1071. (1,2,3,4,5,6)
- * Rodriguez-Salamanca, L.M., Enzenbacher, T.B., Derie, M.L., du Toit, L.J., Feng, C., Correll, J.C., and Hausbeck, M.K. 2012. First report of *Colletotrichum coccodes* causing leaf and neck anthracnose on onions (*Allium cepa*) in Michigan and the United States. *Plant Disease* 96:769. (2,3,4,5,6)
 - * Schroeder, B.K., Humann, J.L., and du Toit, L.J. 2012. Effects of postharvest onion curing parameters on the development of sour skin and slippery skin in storage. *Plant Disease* 96:1548-1555. (1,2,3,4,5,6)
 - * Villarroel-Zeballos, M.I., Feng, C., Iglesias, A., du Toit, L.J., and Correll, J.C. 2012. Characterization of *Verticillium dahliae* from spinach seed, and screening for resistance to *Verticillium* wilt in spinach. *HortScience* 47:1297-1303. (1,2,3,6)
 - * Wohleb, C.H., Waters, T.D., du Toit, L.J., and Schroeder, B.K. 2012. The Washington State University Onion Cultivar Trial: An important resource for Washington onion growers. *Acta Horticulturae* 969:241-246. (3,4,5,6)
- 2011 (3) Correll, J.C., Bluhm, B.H., Feng, C., Lamour, K., du Toit, L.J., and Koike, S.T. 2011. Spinach: Better management of downy mildew and white rust through genomics. *European Journal of Plant Pathology* 129:193-205. (5,6)
- * Dung, J., du Toit, L.J., and Johnson, D.J. 2011. *Verticillium* wilt of skullcap and potential for pathogen dissemination via seeds and stems. *Plant Disease* 95:1147-1152. (1,2,3,4,5,6)
- Pataky, J.K., Williams II, M.M., Headrick, J.M., Nankam, C., du Toit, L.J., and Michener, P.M. 2011. Observations from a quarter century of evaluating reactions of sweet corn hybrids in disease nurseries. *Plant Disease* 95:1492-1506 (Feature Article). (3,4,6)
- 2010 (3) Atallah, Z.K., Maruthachalam, K., du Toit, L.J., Koike, S.T., Davis, R.M., Klosterman, S.J., Hayes, R.J., and Subbarao, K.V. 2010. Population analyses of the vascular plant pathogen *Verticillium dahliae* detect recombination and transcontinental gene flow. *Fungal Genetics and Biology* 47:416-422. (3,5,6)
- * Schroeder, B.K., and du Toit, L.J. 2010. Effects of postharvest onion curing parameters on *Enterobacter* bulb decay in storage. *Plant Disease* 94:1425-1430. (1,2,3,4,5,6)
 - * Schroeder, B.K., Waters, T.W., and du Toit, L.J. 2010. Evaluation of onion cultivars for resistance to *Enterobacter cloacae* in storage. *Plant Disease* 94:236-243. (1,2,3,4,5,6)
- 2009 (5) * Bull, C.T., and du Toit, L.J. 2009. First report of bacterial blight on conventionally and organically grown arugula in Nevada caused by *Pseudomonas syringae* pv. *alisalensis*. *Plant Disease* 93:109. (1,2,3,4,5,6)
- * Cummings, J.A., Miles, C.A., and du Toit, L.J. 2009. Greenhouse evaluation of seed and drench treatments for organic management of seedling blight pathogens of spinach. *Plant Disease* 93:1281-1292. (1,2,3,4,5,6)
- Eastwell, K.C., du Toit, L.J., and Druffel, K.L. 2009. Helleborus net necrosis virus: A new Carlavirus associated with a disease of *Helleborus* spp. *Plant Disease* 93:332-338. (1,2,3,6)
- * Koike, S.T., du Toit, L.J., and Derie, M.L. 2009. A leaf blight of chives, caused by *Botrytis byssoidea*, in California. *Plant Disease* 93:844. (3,4,5,6)
 - * Schroeder, B.K., du Toit, L.J., and Schwartz, H.F. 2009. First report of *Enterobacter cloacae* causing onion bulb rot in the Columbia Basin of Washington State. *Plant Disease* 93:323. (2,4,5,6)
- 2008 (1) * Mou, B., Koike, S.T., and du Toit, L.J. 2008. Screening for resistance to leaf spot diseases of spinach. *HortScience* 43:1706-1710. (1,2,3,4,5,6)
- 2007 (2) * Chilvers, M.I., du Toit, L.J., Akamatsu, H., and Peever, T.L. 2007. A real-time PCR seed assay for *Botrytis* spp. that cause neck rot of onion. *Plant Disease* 91:599-608. (1,2,3,4,5,6)
- * du Toit, L.J., Burger, J.T., McLeod, A., Engelbrecht, M., and Viljoen, A. 2007. *Iris yellow spot virus* in onion seed crops in South Africa. *Plant Disease* 91:1203. (1,3,5,6)
- 2006 (5) * Chilvers, M.I., and du Toit, L.J. 2006. Detection and identification of *Botrytis* species associated with neck rot, scape blight, and umbel blight of onion. Online. *Plant Health Progress* doi:10.1094/PHP-2006-1127-01-DG. (1,2,3,4,5,6)
- * Gent, D.H., du Toit, L.J., Fichtner, S.F., Mohan, S.K., Pappu, H.R., and Schwartz, H.F. 2006. *Iris yellow spot virus*: An emerging threat to onion bulb and seed production. *Plant Disease* 90:1468-1480 (Feature Article). (1,3,4,5,6)
 - * Hernandez-Perez, P., and du Toit, L.J. 2006. Seedborne *Cladosporium variabile* and *Stemphylium botryosum* in spinach. *Plant Disease* 90:137-145. (1,2,3,4,5,6)
- Lee, I.-M., Bottner, K.D., Munyaneza, J.E., Davis, R.E., Crosslin, J.M., du Toit, L.J., and Crosby, T. 2006. Carrot purple leaf: A new spiroplasmal disease associated with carrots in Washington State. *Plant Disease* 90:989-993. (3,6)

- * Pappu, H.R., du Toit, L.J., Schwartz, H.F., and Mohan, K. 2006. Sequence diversity of the nucleoprotein gene of *Iris yellow spot virus* (genus *Tospovirus*, family Bunyaviridae) isolates from the western region of the United States. *Archives of Virology* 151:1015-1023. (1,2,3,5,6)
- 2005 (5) * du Toit, L.J., Crowe, F.J., Derie, M.L., Simmons, R.B., and Pelter, G.Q. 2005. Bacterial blight of carrot seed crops in the Pacific Northwest. *Plant Disease* 89:896-907. (1,2,3,4,5,6)
- * du Toit, L.J., Derie, M.L., and Hernandez-Perez, P. 2005. Verticillium wilt in spinach seed production. *Plant Disease* 89:4-11. (1,2,3,4,5,6)
- * du Toit, L.J., and Hernandez-Perez, P. 2005. Efficacy of hot water and chlorine for eradication of *Cladosporium variabile*, *Stemphylium botryosum*, and *Verticillium dahliae* from spinach seed. *Plant Disease* 89:1305-1312. (1,2,3,4,5,6)
- * Glawe, D.A., Pelter, G.Q., and du Toit, L.J. 2005. First report of powdery mildew of carrot and parsley caused by *Erysiphe heraclei* in Washington State. Online. *Plant Health Progress* doi:10.1094/PHP-2005-0114-01-HN. (1,2,3,4,5,6)
- * Koike, S.T., Matheron, M.E., and du Toit, L.J. 2005. First report of leaf spot of spinach, caused by *Stemphylium botryosum*, in Arizona. *Plant Disease* 89:1209. (3,4,5,6)
- 2004 (4) * du Toit, L.J., Derie, M.L., and Pelter, G.Q. 2004. *Botrytis* species in onion seed crops in Washington. *Plant Disease* 88:1061-1068. (1,2,3,4,5,6)
- * du Toit, L.J., Glawe, D.A., and Pelter, G.Q. 2004. First report of powdery mildew of onion (*Allium cepa*) caused by *Leveillula taurica* in the Pacific Northwest. Online. *Plant Health Progress* doi:10.1049/PHP-2004-1129-01-HN. (1,2,3,4,5,6)
- * du Toit, L.J., Pappu, H.R., Druffel, K.L., and Pelter, G.Q. 2004. *Iris yellow spot virus* in onion bulb and seed crops in Washington. *Plant Disease* 88:222. (1,2,3,4,5,6)
- * Glawe, D.A., du Toit, L.J., and Pelter, G.Q. 2004. First report of powdery mildew on potato caused by *Leveillula taurica* in North America. Online. *Plant Health Progress* doi:10.1094/PHP-2004-1214-01-HN. (1,2,3,4,5,6)
- 2003 (3) * du Toit, L.J., Inglis, D.A., and Pelter, G.Q. 2003. *Fusarium proliferatum* pathogenic on onion bulbs in Washington. *Plant Disease* 87:750. (1,2,3,4,5,6)
- * du Toit, L.J., and Pelter, G.Q. 2003. Wilt of radish caused by *Fusarium oxysporum* f. sp. *raphani* in Washington State. *Plant Health Progress* doi:10.1094/PHP-2003-0616-01-HN. (1,2,3,4,5,6)
- * Putnam, M.L., and du Toit, L.J. 2003. First report of Alternaria blight caused by *Alternaria panax* on ginseng (*Panax quinquefolias* L.) in Oregon and Washington, USA. *New Disease Reports, British Society for Plant Pathology*. <http://www.bspp.org.uk/ndr/jan2003/2002-31.asp>. (1,2,3,4,5,6)
- 2002 (1) * du Toit, L.J., Derie, M.L., Hsiang, T., and Pelter, G.Q. 2002. *Botrytis porri* in onion seed crops and onion seed. *Plant Disease* 86:1178. (1,2,3,4,5,6)
- 2001 (1) * du Toit, L.J., and Derie, M.L. 2001. *Stemphylium botryosum* pathogenic on spinach seed crops in Washington. *Plant Disease* 85:920. (1,2,3,4,5,6)
- 2000 (1) Pataky, J.K., du Toit, L.J., and Freeman, N.D. 2000. Stewart's wilt reaction of an international collection of *Zea mays* germplasm inoculated with *Erwinia stewartii*. *Plant Disease* 84:901-906. (3,6)
- 1999 (3) * du Toit, L.J., and Pataky, J.K. 1999. Effects of silk maturity and pollination on infection of maize ears by *Ustilago maydis*. *Plant Disease* 83:621-626. (1,3,4,5,6)
- * du Toit, L.J., and Pataky, J.K. 1999. Variation associated with silk channel inoculation for common smut of sweet corn. *Plant Disease* 83:727-732. (1,3,4,5,6)
- * du Toit, L.J., and Pataky, J.K. 1999. Reactions of processing sweet corn hybrids to Gibberella ear rot. *Plant Disease* 83:176-180. (3,4,5,6)
- 1998 (2) Pataky, J.K., du Toit, L.J., Tracy, W.F., and Revilla, P. 1998. Reactions of open-pollinated sweet corn cultivars to Stewart's wilt, common rust, northern leaf blight, and southern leaf blight. *Plant Disease* 82:939-944. (3,6)
- Pataky, J.K., Raid, R.N., du Toit, L.J., and Schueneman, T.J. 1998. Disease severity and yield of sweet corn hybrids with resistance to northern leaf blight. *Plant Disease* 82:57-63. (3,6)
- 1997 (2) * du Toit, L.J., Kirby, H.W., and Pedersen, W.L. 1997. Evaluation of an aeroponics system to screen maize genotypes for resistance to *Fusarium graminearum* seedling blight. *Plant Disease* 81:175-179. (3,4,5,6)
- Pataky, J.K., du Toit, L.J., and Kerns, M.R. 1997. Bacterial leaf blight on *shrunken-2* sweet corn. *Plant Disease* 81:1293-1298. (3,6)
- 1996 (1) Pataky, J.K., du Toit, L.J., Kunkel, T.E., and Schmitt, R.A. 1996. Severe Stewart's wilt in central Illinois on sweet corn hybrids moderately resistant to *Erwinia stewartii*. *Plant Disease* 80:104. (3,6)

Manuscripts submitted and in review (2)

- 2017 * Weber, J.M., and du Toit, L.J. 2017. Effects of Contans WG and burial of sclerotia on survival of sclerotia of *Sclerotinia sclerotiorum* in the Columbia Basin of central Washington. Plant Disease: submitted May 2017. PDIS-05-17-0695-RE (1,2,3,4,5,6)
- Zou, Z., Zhang, X., Parks, P., du Toit, L.J., Van de Wouw, A. P., and Dilantha Fernando, W.G. 2017. A new subclade of *Leptosphaeria biglobosa* identified from *Brassica rapa*. Plant Pathology: submitted 19 Jun. 2017. PP-17-252 (1,2,3,6)

Manuscripts in preparation (5)

- * Alcalá, A.C., Porter, L.D., and du Toit, L.J. 201_. Evaluation of seed and drench treatments for control of damping-off in organic pea production in the inland Pacific Northwest. Plant Disease: in preparation. (1,2,3,4,5,6)
- * du Toit, L.J., and Derie, M.L. 201_. Impact of powdery mildew on carrot seed production in the Columbia Basin of Washington State. Plant Disease: in preparation. (1,2,3,4,5,6)
- * Gatch, E.W., and du Toit, L.J. 201_. Micronutrient-mediated virulence of *Fusarium oxysporum* f. sp. *spinaciae*. Plant Disease: in preparation. (1,2,3,4,5,6)
- * Knerr, J., Humann, J., Armstrong, C., du Toit, L., and Schroeder, B. 201_. Development of a bacterial DNA macroarray for rapid identification and differentiation of onion bulb rot pathogens. In preparation. (1,2,3,6)
- * Weber, J.M., Chen, W., and du Toit, L.J. 201_. Prevalence of white mold and genetic diversity of *Sclerotinia sclerotiorum* causing basal stalk rot in sunflower seed crops in the Columbia Basin of central Washington. Plant Pathology: in internal review. (1,2,3,4,5,6)

Professional articles, non-refereed (53)

- 2017 (3) * du Toit, L.J. 2017. Evaluation of onion disease management practices and opportunities for enhanced onion disease management in Sacapulas, Quiché, Guatemala. Report for the Farmer-2-Farmer Program of the US Agency for International Development, following a 2-week volunteer project with onion farmers in the highlands of Guatemala. 19 pp.
- * du Toit, L.J. 2017. Editor and co-author for research and extension personnel for 8 participating states. 2017. SAES-422 Multistate Research Activity 2016 Accomplishment Report for: W2008 Biology and Management of *Iris yellows spot virus* (IYSV), Other Diseases, and Thrips in Onions. 21 pp. Submitted to USDA NIMSS in Jan. 2016.
- * Paulitz, T., du Toit, L.J., Mazzola, M., Okubara, P., Weller, D., and Tomashow, L. 2017. Western Regional Project W-3147 2016 Annual Report: Managing Plant-Microbe Interactions in Soil to Promote Sustainable Agriculture. 16 pp. Submitted to USDA NIMSS in Jan. 2016.
- 2016 (11) * Carmody, S.M., and du Toit, L.J. 2016. Management of light leaf spot and white leaf spot in brassica crops in the Pacific Northwest. Seed Matters/Clif Bar Family Foundation Progress Report, Nov. 2016. 7 pp.
- * Carmody, S., and du Toit, L.J. 2016. Seed transmission and management of white leaf spot and light leaf pathogens of brassicas in the Pacific Northwest. Western SARE Project GW16-055 Mid-Year Progress Report, Jan. 2016. 5 pp.
- * du Toit, L.J. 2016. Identification and management of downy mildew in onion bulb and seed crops in the Columbia Basin. Pp. 6-7 in: 2016 WSU Onion Cultivar Demonstration and Field Day Handout, 25 Aug. 2016, Othello, WA. 16 pp.
- * du Toit, L.J., Correll, J.C., Derie, M.L., Pavel, J., and Feng, C. 2016. *Phomopsis* on spinach seed: Evaluation of a seed health assay, efficacy of seed treatments, and pathogenicity of seed isolates on spinach. Project report, American Seed Trade Association's American Seed Research Fund, July 2016. 26 pp.
- du Toit, L.J., Gilijamse, E., Oosterhof, J., Hiddink, G., and Politikou, L. 2016. 7-0XX. Detection of *Verticillium dahliae* on *Spinacia oleracea* (spinach) seed. Annexe to Chapter 7: Seed Health Testing Methods, International Rules for Seed Testing. International Seed Testing Association, Bassersdorf, Switzerland. 11 pp.
- * du Toit, L.J., and Waters, T.W. 2016. Irrigation management for control of onion internal dry scale and bacterial bulb rots. Pp. 10-11 in: 2016 WSU Onion Cultivar Demonstration and Field Day Handout, 25 Aug. 2016, Othello, WA. 16 pp.

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- * du Toit, L.J. 2001. Seedborne diseases of carrot. Pages 187-192, In: Proceedings of the Pacific Northwest Vegetable Association Annual Convention & Trade Show, 28-29 Nov. 2001, Pasco, WA.
- * du Toit, L.J., and Derie, M.L. 2001. Stemphylium leaf spot of spinach seed crops in Washington State. Pages 8-9, In: Proceedings of the National Spinach Conference, 14-15 Nov. 2001, Fayetteville, AR.
- * du Toit, L.J., Inglis, D.A., and Derie, M.L. 2001. *Cladosporium* on spinach: Biology and management. In: Proceedings of the 90th Annual Meeting of the Western Washington Horticulture Association, 3-5 Jan. 2001, SeaTac, WA.
- 2000 (1) Hamm, P.B., Clough, G.H., Baune, M., and du Toit, L.J. 2000. Combating common smut in the Columbia Basin. Pages 71-82, In: Proceedings of the Pacific Northwest Vegetable Association Annual Convention and Trade Show, 13-14 Nov. 2000, Pasco, WA.
- 1998 (1) * du Toit, L.J. 1998. Smut rules? Pages 35-44, In: Proceedings of the Pacific Northwest Vegetable Association Annual Convention and Trade Show, 19-20 Nov. 1998, Pasco, WA.

Web pages developed and maintained (1)

- 2009-16 (1) * du Toit, L.J., Inglis, D.A., and Ostrander, C. Pacific Northwest Vegetable Extension Group (PNW VEG) website: http://mtvernon.wsu.edu/path_team/vegpath_team.htm (revised regularly)

Popular periodicals (>27)

- 2015 (1) * du Toit, L.J., Waters, T., and Reitz, S. 2015. Internal dry scale and associated bulb rots: Bane of the 2014 Pacific Northwest onion season. *Onion World* May/June 2015:4-7.
- 2014 (1) * Schroeder, B.K., du Toit, L.J., Waters, T., and Reitz, S. 2014. Tackling challenges facing Pacific Northwest onion growers. *Onion World* Dec. 2014:20-23. (1,2,3,4,5,6)
- 2009 (3) * Alcalá, A.C., and du Toit, L.J. 2009. Management of damping-off in organic vegetable crops in the Pacific Northwest. *Sustaining the Pacific Northwest* 7(4):5-7. <http://csanr.wsu.edu/publications/SPNW/SPNW-v7-n4.pdf>.
- * du Toit, L.J., and Gatch, E.W. 2009. Increasing the capacity for spinach seed production in the United States by promoting soil suppression of Fusarium wilt. *The Western Front*, Oct. 2009: Page 7 (Western Integrated Pest Management Center). <http://www.wripmc.org/Newsletter/October%202009%2010-6-09%20for%20posting.pdf>
- * Pacific Northwest Vegetable Extension Group. 2009. Physiological leaf roll of tomato. *Sustaining the Pacific Northwest* 7(4):7-8. <http://csanr.wsu.edu/publications/SPNW/SPNW-v7-n4.pdf>.
- 2008 (1) * du Toit, L.J. 2008. Soil amendment with limestone for management of Fusarium wilt in spinach seed crops in the Pacific Northwest. *Sustaining the Pacific Northwest* 5(2):5-9. <http://csanr.wsu.edu/InfoSources/#newsletter>
- 2006 (2) * du Toit, L.J., and Inglis, D.A. (eds). 2006. Pacific Northwest Vegetable Extension Group (PNW VEG) newsletter for each of Jun. & Aug. 2006. http://mtvernon.wsu.edu/path_team/currentnewlet.htm
- * du Toit, L.J. Seedborne diseases of carrot. *Carrot Country* 14 (1):13-15.
- 2005 (2) * du Toit, L.J., and Inglis, D.A. (eds). 2005. WSU Vegetable Pathology Team newsletters for each of Jun. & Aug. 2005. http://mtvernon.wsu.edu/path_team/currentnewlet.htm
- 2004 (2) * du Toit, L.J., and Inglis, D.A. (eds). 2004. WSU Vegetable Pathology Team newsletters for each of Jun./Jul. & Aug./Sep. 2004. http://mtvernon.wsu.edu/path_team/currentnewlet.htm
- 2003 (4) Inglis, D.A., and du Toit, L.J. 2003. WSU Vegetable Pathology Team newsletters for each of May, Jun., Jul. & Aug. 2003. http://mtvernon.wsu.edu/path_team/currentnewlet.htm
- 2002 (7) * du Toit, L.J., and Inglis, D.A. (eds). 2002. WSU Vegetable Pathology Team newsletter. Jul. 2002.

http://mtvernon.wsu.edu/path_team/currentnewlet.htm

Inglis, D.A., and du Toit, L.J. (eds). 2002. WSU Vegetable Pathology Team newsletters for each of May, Jun., & Aug. 2002. http://mtvernon.wsu.edu/path_team/currentnewlet.htm

* du Toit, L.J. 2002. Diagnosing plant problems: Part I. What is causing your plant problems? Seattle Tilth 24(3):1 & 6.

* du Toit, L.J. 2002. Diagnosing plant problems: Part II. Biotic plant problems. Seattle Tilth 24(4):5.

* du Toit, L.J. 2002. Diagnosing plant problems: Part III. Abiotic plant problems. Seattle Tilth 24(6):1 & 4, continued in 24(7):1 & 6.

2001 (4) Inglis, D.A., and du Toit, L.J. (eds). 2001. WSU Vegetable Pathology Team newsletters for each of May, Jun., Jul., & Aug. 2001. http://mtvernon.wsu.edu/path_team/currentnewlet.htm

Since 2000 Research cited/quoted in popular periodicals on vegetable and/or seed production, and photos of vegetable and seedborne diseases provided as requested, e.g., for Carrot Country, Onion World, Growing, American Vegetable Grower, seed company newsletters, agricultural research and outreach companies, etc.

On-line articles/images (2)

2004 (1) * Submitted photos of *Sclerotinia sclerotiorum* for “Art in Phytopathology” exhibit at 2005 APS Annual Meeting. Nov. 2004 APSnet Feature Story: <http://www.apsnet.org/online/feature/art/>

2003 (1) * du Toit, L.J., Pelter, G.Q., and Pappu, H.R. 2003. APSnet Image of the Week: *Iris Yellow Spot Virus*. <http://apsnet.org/online/archive/2003/IW000030.asp>

PRESENTATIONS (see also **Proceedings** and **Abstracts** above)

Invited (171)

2017 (8) * du Toit, L.J. title? Invited seminar to Department of Plant Pathology, North Carolina State University, 9 Oct. 2017, Raleigh, NC.

* du Toit, L.J. Seedborne vs. seed transmitted: The curious case of *Phomopsis* in spinach. Invited contribution to Phytoviews session at 2017 APS annual meeting, 5-9 Aug. 2017, San Antonio, TX.

Other panelists were Wayne Wiebe and Christina Devorshack, representing industry and regulatory perspectives on seedborne vs. seed transmitted microorganisms. (xxx people)

* du Toit, L.J. Spinach Seed Health Assay Workshops in Denmark on 6-7 Jun. 2017, and the Netherlands on 8-9 Jun. 2017 (see WORKSHOPS/FIELD DAYS section below). (80 people)

* du Toit, L.J. Vegetable seed crop pathology research, and the Washington State Commission for Pesticide Registration (WSCPR) funding plays in supporting this program. Invited presentation to WSCPR board, 24 May 2017, La Conner, WA. (12 people)

* du Toit, L.J. It takes two to tango: Management of *Stemphylium* leaf blight and downy mildew in the onion leaf blight complex. Invited by University of Wisconsin faculty to speak at Wisconsin Potato & Vegetable Growers' Association Grower Education Conference, 7-9 Feb. 2016, Stevens Point, WI. (Presentation by Skype to 30 onion stakeholders)

* du Toit, L.J., and Carmody, S. Light leaf spot and white leaf spot on brassica crops in western Washington. Wilbur Ellis Growers' Meeting, 2 Feb. 2017, La Conner, WA. (100 people)

* du Toit, L.J. Spinach seed crop pathology research and extension at Washington State University: Engaging principles of the U.S. Land Grant Mission to enhance production of a minor acreage, high value crop. J.E. Vanderplank Memorial Address, 50th Anniv. Congress Southern African Soc. Plant Pathologists, 15-18 Jan. 2017, Champagne Sports Resort, Drakensburg, South Africa. (~200 attendees, see Abstracts above)

2016 (13) * du Toit, L.J. Brassica black leg – The hidden dangers of a seedborne pathogen. Invited by American Seed Trade Association to speak at Western Seed & Lawn Conference because of increasing prevalence of black leg in canola crops in Midwestern states, and concern about infected brassica seed in cover crop seed lots. 6 Nov. 2016, Kansas City, MO. (75 cover crop stakeholders)

* du Toit, L.J. Tapping into growers' expertise: Effective engagement in extension. Invited presentation by APS Graduate Student Committee, 'Fieldside Manner' special session, APS Annual Meeting, 30 Jul. – 3 Aug. 2016, Tampa, FL (also see Abstracts above).

* du Toit, L.J. Mycorrhizal inoculants in onion production: Possibilities and pitfalls? 65th Muck Vegetable Growers' Conference, 12-13 Apr. 2016, Bradford, Ontario, Canada. (75 growers)

* du Toit, L.J. Spinach seed health and production practices. Invited presentation to Spinach Committee, California Seed Association Annual Meeting, 21-23 Mar. 2016, Napa, CA. (45 people)

- * Ocamb, C.M. and du Toit, L.J. Managing seedborne pathogens: Black leg in brassica crops in the Pacific Northwest and implications for the organic seed industry. 8th Organic Seed Growers' Conf., 4-6 Feb. 2016, Corvallis, OR (also in Proceedings above).
- * du Toit, L.J. Onion internal dry scale and internal bulb rots – The new bane of PNW onions. Invited presentation, 56th Annual Meeting of the Idaho & Malheur County, OR Onion Growers' Associations, 2 Feb. 2012, Ontario, OR. (150 people)
- * du Toit, L.J., Thornton, T., Simerly, R., and Reitz, S. Pink root panel discussion. 56th Annual Meeting of the Idaho & Malheur County, OR Onion Growers' Associations, 2 Feb. 2012, Ontario, OR. (150 people)
- * du Toit, L.J. Onion white rot quarantine update. Columbia Basin Vegetable Seed Assoc. Annual Meeting, 22 Jan. 2015, Moses Lake, WA. (60 people)
- * du Toit, L.J. Update on brassica black leg in the PNW. Columbia Basin Vegetable Seed Assoc. Annual Meeting, 22 Jan. 2015, Moses Lake, WA. (60 people)
- Weber, J., and du Toit, L.J. Research efforts to enhance management of white mold in sunflower seed crops. Columbia Basin Vegetable Seed Assoc. Annual Meeting, 22 Jan. 2015, Moses Lake, WA. (60 people)
- * du Toit, L.J. Diagnosing plant problems – Not so elementary, dear Watson! Columbia Basin Crop Consultants' Assoc. Short Course, 13-14 Jan. 2016, Moses Lake, WA. (85 people)
- * du Toit, L.J. Onion internal dry scale and management of culled bulbs. Columbia Basin Crop Consultants' Assoc. Short Course, 13-14 Jan. 2016, Moses Lake, WA. (85 people)
- * du Toit, L.J. Brassica black leg update. Pacific Northwest Direct Seed Association Cropping Systems Conference, 12-13 Jan. 2016, Kennewick, WA. 2 pp. <http://www.directseed.org/events/annual-conference/> (see Proceedings above) (40 people)
- 2015 (20) * du Toit, L.J., and Waters, T.W. Growing onion bulb crops and Allium seed crops in close proximity: IYSV risk assessment and management. Onion Session of the Pacific Northwest Vegetable Association Annual Convention & Trade Show, 18-19 Nov. 2015, Kennewick, WA. (~250 people)
- * du Toit, L.J. Ignorance is bliss? History repeated for crucifer black leg in the Pacific Northwest. General Vegetable Session of the Pacific Northwest Vegetable Association Annual Convention & Trade Show, 18-19 Nov. 2015, Kennewick, WA. (~100 people)
- * du Toit, L.J. Onion internal dry scale and bulb rots. Onion Session of the Pacific Northwest Vegetable Association Annual Convention & Trade Show, 18-19 Nov. 2015, Kennewick, WA. (~250 people)
- * du Toit, L.J. Ignorance is bliss? History repeated for crucifer black leg in the Pacific Northwest. Washington Tilth Producers' Association Annual Meeting, 13-15 Nov. 2015, Spokane, WA. (~50 people)
- * du Toit, L.J. Onion diseases in Washington State. Invited presentation at 38th Argentine Horticultural Congress, 16th National Floricultural Conf., 8th Scientific Meeting on Onion from MERCOSUR, and 3rd Regional Plant Protection and Toxicology Conf., 5-8 Oct. 2015, Bahía Blanca, Argentina. (150 attendees). Also participated in two meetings with onion stakeholders in Lower Rio Colorado River, with a presentation at each meeting on onion bacterial bulb rots.
- * du Toit, L.J. Ignorance is bliss? History repeated for brassica black leg in the Pacific Northwest. Presentation to Skagit Co. Commissioners, 25 Aug. 2015, Mount Vernon, WA. (5 people + presentation recording televised) http://skagit.granicus.com/MediaPlayer.php?view_id=8&clip_id=2036
- * du Toit, L.J. Invited by Cornell University Plant Pathology & Plant-Microbe Biology Graduate Student Association to give 2 seminars and meet with students and faculty to discuss the WSU vegetable seed pathology program. Seminar topics on 'Seeds Sown and Harvests Reaped: Vegetable Seed Crop Pathology in the Pacific Northwest' on the Ithaca campus on 11 Mar., and 'Establishing a Career in Applied Plant Pathology' on the Geneva campus on 12 Mar. 2015.
- * du Toit, L.J. Black leg, light leaf spot, and white leaf spot of crucifers in the Pacific Northwest: Lessons learned from the 2014 Willamette Valley epidemic. Douglas Co. and Okanogan Co. Growers Meeting, Invited to help growers avoid introducing seedborne pathogens on crucifer cover crop and canola seed. 3 Mar. 2015, Waterville, WA. (25 people)
- * du Toit, L.J., Derie, M.L., Correll, J.C., and Feng, C. 2015. *Phomopsis/Diaporthe* and spinach seed: History, concerns, and research update. 2015 International Spinach Conference, 24-25 Feb. 2015, Yuma, AZ (also listed in abstracts above). (~200 people)
- * du Toit, L.J., and Derie, M.L. Suppression of Fusarium wilt in spinach seed production using compost. 2015 International Spinach Conference, 24-25 Feb. 2015, Yuma, AZ (also listed in abstracts above). (~200 people)
- * du Toit, L.J. Black leg of crucifers in the Pacific Northwest: Lessons learned from the 2014 Willamette

- Valley epidemic. Skagit Farmers' Supply Growers' Recertification Day, 18 Feb. 2015, Mount Vernon, WA. (~150 people)
- * du Toit, L.J. Black leg in brassica crops and foliar nutrient analyses for table beet seed crops. Wilbur-Ellis Co. and Sakata America Annual Seed Growers' Meeting, 3 Feb. 2015, Burlington, WA. (75 people)
 - * du Toit, L.J. 2014 Black leg, light leaf spot, and white leaf spot epidemic in the Willamette Valley of Oregon: Protecting Washington's Brassica seed industry. Puget Sound Seed Growers' Association Annual Meeting, 30 Jan. 2015, Mount Vernon, WA. (75 people)
 - * du Toit, L.J., and Derie, M.L. Table beet seed production in Washington: 2014 Disease and fertility assessments. Puget Sound Seed Growers' Association Annual Meeting, 30 Jan. 2015, Mount Vernon, WA. (75 people)
 - * du Toit, L.J., and Correll, J. Update on *Phomopsis (Diaporthe)* and spinach seed. Presentation to the Emerging Disease Committee, 54th American Seed Trade Association Vegetable & Flower Conference, 24-27 January 2015, Tampa, FL (80 people)
 - * du Toit, L.J. Emerging Brassica diseases in the Pacific Northwest: Black leg, light leaf spot, and white leaf spot. Presentation to the Emerging Disease Issues Committee, 54th American Seed Trade Association Vegetable & Flower Conference, 24-27 January 2015, Tampa, FL (80 people)
 - * du Toit, L.J., and Correll, J. Update on *Phomopsis (Diaporthe)* and spinach seed. Presentation to the American Seed Research Foundation Committee, 54th American Seed Trade Association Vegetable & Flower Conference, 24-27 January 2015, Tampa, FL (40 people)
 - * du Toit, L.J. Allium, bean, and crucifer seed quarantines in Washington: Do the rules suffice? Columbia Basin Crop Consultants' Association 2015 Short Course, 21-22 Jan. 2015, Moses Lake, WA. (~150 people)
 - * Myers, R., and du Toit, L.J. Keynote panel – An overview of cover cropping in the PNW – Opportunities and challenges. Presentation on the 2014 black leg epidemic in the Willamette Valley, and potential modifications to the WSDA crucifer quarantine to protect brassica oilseed crops in the irrigated and dryland areas of central and eastern Washington. 2015 PNW Oilseed & Direct Seed Conference, 20-22 Jan. 2014, Kennewick, WA. (~250 people) <http://css.wsu.edu/biofuels/presentations/2015pnw-oilseed-direct-seed-conference/powerpoint-presentations/>
 - * du Toit, L.J. Allium, bean, and crucifer seed quarantines in Washington: Do the rules suffice? Columbia Basin Vegetable Seed Association Annual Meeting, 20 Jan. 2014, Moses Lake, WA. (~100 people)
 - * du Toit, L.J. *Iris yellow spot virus* management considerations. Columbia Basin Vegetable Seed Association Annual Meeting, 20 Jan. 2014, Moses Lake, WA. (~100 people)
 - 2014 (19) * du Toit, L.J. Soil health for disease suppression. Building Soils for Better Crops 2014 Conference, 10 Dec. 2014, Moses Lake, WA. (~125 people) <http://csanr.wsu.edu/program-areas/bioag/bioag-conferences-proceedings/soils/>
 - * du Toit, L.J. WSDA crucifer quarantine: Do the rules suffice? Presentation and discussion with the Washington State Department of Agriculture Seed Program and oilseed growers and seed companies in central and eastern Washington. 13 Nov. 2014, Kennewick, WA. (36 people)
 - * du Toit, L.J. *Iris yellow spot virus* management considerations. Onion session of the Pacific Northwest Vegetable Association Annual Convention & Trade Show, 12-13 Nov. 2014, Kennewick, WA. (~250 people)
 - * du Toit, L.J. Onion mycorrhizae. Onion session of the Pacific Northwest Vegetable Association Annual Convention & Trade Show, 12-13 Nov. 2014, Kennewick, WA. (~250 people)
 - * du Toit, L.J., and Waters, T. Carrot insect pests and diseases. Pest Management session of the Pacific Northwest Vegetable Association Annual Convention & Trade Show, 12-13 Nov. 2014, Kennewick, WA. (~150 people)
 - * du Toit, L.J. *Allium*, bean, & crucifer quarantine diseases in Washington: Do the current rules suffice? 21st Joint Meeting of the Washington State Crop Improvement Association/Washington North-Idaho Seed Association, 10-11 Nov. 2014, Spokane, WA. (~100 people)
 - * du Toit, L.J. Quarantine bacterial diseases of bean in Washington: Current status and potential quarantine amendments. Bean Seed Branch Meeting of the Washington State Department of Agriculture, at the 21st Joint Meeting of the Washington State Crop Improvement Association/Washington North-Idaho Seed Association, 10-11 Nov. 2014, Spokane, WA. (~25 people)
 - * du Toit, L.J. Neck rot in onions. Bejo Zaden Training Days – Onion and Cauliflower. 2-5 Sep. 2014, Warmenhuizen, The Netherlands (~80 people). The trip included 4 days of meetings with growers, seed

- production and sales personnel, and plant pathologists at Bejo Zaden.
- * du Toit, L.J. Detection methods for seedborne bacteria and nematodes. Invited presentation for the session ‘Advances in detection of plant pathogens in seeds and their implications’, 47th Brazilian Phytopathological Meeting, 17-22 Aug. 2014, Londrina, Brazil. (~250 people)
 - * du Toit, L.J. White mold: *Sclerotinia sclerotiorum*. Invited presentation for the workshop ‘Managing *Sclerotinia*/White Mold in the Columbia Basin’, 19 Mar. 2014, Moses Lake, WA. (90 people)
 - * du Toit, L.J. Mycorrhizae and Fusarium basal rot in onion bulb crops. Two invited presentations and discussion with onion bulb growers and consultants in the Ceres and Kouebokkeveld regions of the Western Cape Province, South Africa, 11 Mar. 2014, Ceres, South Africa. (40 people)
 - * du Toit, L.J. Soilborne disease management in vegetable rotations. Invited discussion with vegetable production team of farms in Ceres, South Africa, 11 Mar. 2014, Ceres, South Africa. (10 people)
 - * du Toit, L.J. Black rot and white mold in brassica vegetable seed crops. Invited presentation and discussion with broccoli and cauliflower seed growers for Syngenta Seeds in the Western Cape, South Africa, 10 Mar. 2014, Lutzville, South Africa. (30 people)
 - * du Toit, L.J., and Price Youngquist, C. Biosolids compost use in vegetable seed crops, potatoes, and small grains. Invited presentation, Soil Quality Network 2014, 13 Feb. 2014, Mount Vernon, WA. (~100 people)
 - * du Toit, L.J., and Lew-Smith, J. Managing seedborne diseases in seed production. Invited presentation, 7th Organic Seed Growers’ Conference, 30 Jan. – 2 Feb. 2014, Corvallis, OR. (~65 people) Webinar recorded presentation: <http://bit.ly/1iXoUbO>
 - * du Toit, L.J. Diagnosing diseases in the field. Invited presentation, Annual Basin Producers 2014 Pesticide Recertification Day, 17 Jan. 2014, Moses Lake, WA. (~200 people)
 - * du Toit, L.J. Does this product really work? Distinguishing sound science from hot air in product promotional materials. Invited presentation, Columbia Basin Crop Consultants Association 2014 Short Course, 15-16 Jan. 2014, Moses Lake, WA. (~80 people)
 - * du Toit, L.J. Management of *Botrytis* in onion; and vascular wilts, leaf spots, and *Phomopsis*, a quarantine fungus, in spinach. Bejo Seeds, Inc. Invited presentation to the Bejo Seeds, Inc. International Sales and Production Meeting, 13 Jan. 2014, Mount Vernon, WA. (~25 managers, sales, & seed production employees of Bejo Seeds, Inc.)
- 2013 (24) * du Toit, L.J. Vegetable seed production and seed pathology in the Pacific Northwest USA. Invited seminar to the Agricultural College, South China Agricultural University, 13 Dec. 2013, Guangzhou, China. (~75 agricultural students)
- * du Toit, L.J. Spinach seed production in the USA. International Spinach Conference, 10-12 Dec. 2013, Guangzhou, China. (~150 people)
 - * du Toit, L.J. Doubling the capacity for spinach seed production in the USA: A dream or reality? International Spinach Conference, 10-12 Dec. 2013, Guangzhou, China. (~150 people)
 - * du Toit, L.J. Neck rot identification and management based on Achilles’ heel. Invited presentation, The UK Onion and Carrot Conference & Exhibition, 20-21 Nov. 2013, Peterborough, UK. (~350 people)
 - * du Toit, L.J. Diagnosing diseases in the field. Pest Management Session. Pacific Northwest Vegetable Association 26th Annual Conference & Trade Show, 13-14 Nov. 2013, Kennewick, WA. (~200 people)
 - * du Toit, L.J. Does this product really work? Distinguishing sound science from hot air in product promotional materials. General Vegetable Session. Pacific Northwest Vegetable Association 26th Annual Conference & Trade Show, 13-14 Nov. 2013, Kennewick, WA. (~75 people)
 - * du Toit, L.J. Mycorrhizae in onion bulb crops. Organic Session. Pacific Northwest Vegetable Association 26th Annual Conference & Trade Show, 13-14 Nov. 2013, Kennewick, WA. (~75 people)
 - * du Toit, L.J. Why was pink root so prevalent in 2013? Onion Session. Pacific Northwest Vegetable Association 26th Annual Conference & Trade Show, 13-14 Nov. 2013, Kennewick, WA. (~125 people)
 - * du Toit, L.J. Pacific Northwest carrot diseases. General Vegetable Session. Pacific Northwest Vegetable Association 26th Annual Conference & Trade Show, 13-14 Nov. 2013, Kennewick, WA. (~50 people)
 - * du Toit, L.J. Establishing a career in applied plant pathology. Invited presentation for the Guest Speaker Seminar Program of the Plant Pathology Graduate Student Association, Department of Plant Pathology, The Ohio State University, 28 Oct. 2013. Met with faculty, staff, and graduate students in Wooster (27-28 Oct.) and Columbus (29 Oct.), OH.
 - * du Toit, L.J. Establishing a career in applied plant pathology. Invited seminar presentation, Department of Botany and Plant Pathology, Purdue University. 9 Oct. 2013, West Lafayette, IN.

- * du Toit, L.J. Vegetable seed pathology. Invited presentation in the session ‘Meeting Regional Needs’ of the 2nd Annual Student Organic Seed Symposium, ‘Breeding and Advocating for Resilient Organic Seed Systems’, 4-7 Aug. 2013, Mount Vernon, WA.
- * du Toit, L.J. *Phomopsis* on spinach seed. Fiscal cliff? Sequestration? Invited presentation at the American Seed Trade Association Annual Convention, 15-18 Jun. 2013, Nashville, TN.
- * du Toit, L.J. Scientific method and *habeus corpus*: Assessing the significance and management of seedborne pathogens. Invited seminar presentation, PI Sci 501, University of Idaho, 11 Apr. 2013, Moscow, ID.
- * du Toit, L.J. Onion neck rot: Effective management based on Achille’s heel. Invited presentation at the 62nd Annual Muck Vegetable Growers’ Conference, 3-4 Apr. 2013, Bradford, Ontario, Canada.
- * du Toit, L.J. *Phomopsis* and spinach seed: Fiscal cliff? Sequestration? Invited presentation, Annual Research Symposium of the California Leafy Greens Research Board, 19 Mar. 2013, Harris Ranch, CA.
- * du Toit, L.J. Management of *Verticillium* associated with spinach seed. Invited presentation, Annual Research Symposium of the California Leafy Greens Research Board, 19 Mar. 2013, Harris Ranch, CA. Followed by panel discussion on *Verticillium* in lettuce and spinach, with K. Subbarao and S. Koike, moderated by M. Davis, University of California, Davis.
- * du Toit, L.J. Managing seed borne diseases: Lessons learned from *Verticillium* and spinach seed. Invited presentation at Seed Central – Science, organized by the Seed Biotechnology Center, University of California – Davis Seed Science Center, 14 Feb. 2013, Davis, CA. (~100 people)
- * du Toit, L.J. Fusarium and *Verticillium* wilts in spinach seed production: Research update. 2013 Wilbur Ellis/Alf Christianson Seed Co. Vegetable Seed Growers’ Meeting, 6 Fe. 2013, Burlington, WA. (~75 people)
- * du Toit, L.J. Management of *Verticillium* in spinach: Final report. Presented in the Permanent Research Fund Committee and the Emerging Diseases Committee meetings at the American Seed Trade Association’s 52nd Vegetable & Flower Seed Conference, 26-29 Jan. 2013, Scottsdale, AZ. (~150 people cumulative in these committee meetings)
- * du Toit, L.J. *Phomopsis* on spinach seed. Presented in the Phytosanitary Committee, Permanent Research Fund Committee, and Emerging Diseases Committee meetings at the American Seed Trade Association’s 52nd Vegetable & Flower Seed Conference, 26-29 Jan. 2013, Scottsdale, AZ.
- * du Toit, L.J. Disease diagnosis and management. Northwestern Washington Sustainable Agriculture Conference, 23 Jan. 2013, Lynden, WA (~35 people).
- * du Toit, L.J. Emerging vegetable diseases in the Columbia Basin. Annual Basin Producers’ Pesticide Recertification Day, 18 Jan. 2013, Moses Lake, WA (~200 people).
- * du Toit, L.J. Emerging onion diseases in the Columbia Basin. Columbia Basin Crop Consultants’ Association Short Course, 16-17 Jan. 2013, Moses Lake, WA (~120 people).
- 2012 (14) * du Toit, L.J. The university role in agricultural extension: Lessons from Washington State University. Invited presentation and discussion, 12 Oct. 2012, School of Agricultural, Earth and Environmental Science, University of KwaZulu-Natal, Pietermaritzburg, South Africa.
- * du Toit, L.J. Disease management for sustainable onion seed production: What? Who? How? Why? Onion Seed Safari, organized by Klein Karoo Seed Production, 10 Oct. 2012, Oudtshoorn, South Africa.
- * du Toit, L.J. Assessing the significance and management of seedborne *Verticillium* in spinach. Invited presentation, California Seed Association Mid-Year Meeting, 25-26 Sep. 2012, Monterey, CA.
- * du Toit, L.J. Scientific method and *habeus corpus*: Assessing the significance and management of seedborne *Verticillium* in spinach. Invited presentation, *Verticillium* Symposium, APS Pacific Division Annual Meeting, 27-29 Jun. 2012, Sacramento, CA (see abstract above).
- * du Toit, L.J. Effective management of *Botrytis* in onion seed crops. Invited presentation at Annual Educational Growers’ Meeting of the Specialty Seed Growers’ of Western Oregon, 22 Feb. 2012, Albany, OR.
- * du Toit, L.J. Fusarium and *Verticillium* wilts in spinach seed crops. Invited presentation at Annual Educational Growers’ Meeting of the Specialty Seed Growers’ of Western Oregon, 22 Feb. 2012, Albany, OR.
- * du Toit, L.J. Brassica quarantine district. Invited presentation at 30th Annual Western Washington Potato Workshop. 17 Feb. 2012, Mount Vernon, WA.

- * du Toit, L.J. Management practices to reduce stunting caused by *Rhizoctonia*. Invited presentation, 52nd Annual Meeting of the Idaho & Malheur County, Oregon Onion Growers' Associations, 7 Feb. 2012, Ontario, OR.
- * du Toit, L.J. Fusarium and Verticillium wilts in spinach seed production: Research update. Invited presentation, 2012 Wilbur Ellis and Alf Christianson Seed Co. Vegetable Seed Growers' Meeting, 2 Feb. 2012, Burlington, WA.
- * du Toit, L.J. Disease management in onion seed crops: What, when, and how? Invited presentation, Central Oregon Farm Fair & Trade Show, 1-2 Feb. 2012, Madras, OR.
- * du Toit, L.J. Powdery mildew in carrot seed crops: Should I worry? Invited presentation, Central Oregon Farm Fair & Trade Show, 1-2 Feb. 2012, Madras, OR.
- * du Toit, L.J. Spinach seed transmitted pathogen assay (*Verticillium*) and research update. Invited presentation to the Emerging Diseases Committee, American Seed Trade Association's 51st Vegetable & Flower Seed Conference, 21-24 Jan. 2012, Tampa, FL.
- * du Toit, L.J., and Correll, J.C. Management of *Verticillium* in spinach. Invited research presentation to the Vegetable & Flower Seed Research Fund Committee, American Seed Trade Association's 51st Vegetable & Flower Seed Conference, 21-24 Jan. 2012, Tampa, FL.
- * du Toit, L.J. Managing diseases in seed crops. Invited presentation, 6th Organic Seed Growers' Conference, 19-21 Jan. 2012, Pt. Townsend, WA. http://www.seedalliance.org/organic-seed-growers-conference/2012_Seed_Growers_Conference/
- 2011 (6) * du Toit, L.J. Damping-off in carrot. Invited presentation, 35th Internat. Carrot Conf., 30 Nov. – 2 Dec. 2011, Johannesburg, South Africa. <http://www.carrotconference.co.za/>
- * du Toit, L.J. Research on efficacy of organic seed treatments for fungal pathogens: Spinach as a case study. Invited presentation at American Seed Trade Association Organic Seed Workshop, Phytosanitary Measures for Organic or Untreated Seed Sold to Mexico, 20 Oct. 2011, Merida, Mexico. <http://www.amseed.com/PDFs/US-Mexico-Seed-Workshop/12-EfficacyOrganicSeedTreatments-Spinach.pdf>
- * du Toit, L.J. *Fusarium* and *Verticillium* in relation to spinach seed. Invited presentation at Rijk Zwaan Seed Co. headquarters, 5 Oct. 2011, Delft, The Netherlands.
- * du Toit, L.J. Selecting a spinach seed health assay for *Verticillium*: Results of an ISHI ring test. International Spinach Conference, 3-4 Oct. 2011, Amsterdam, The Netherlands (paper). <http://spinach.uark.edu/Spinach%20Conference%20Program%20Final%20092611.pdf>
- * du Toit, L.J. History of research on management of *Xanthomonas hortorum* pv. *carotae* in carrot seed crops. Carrot Seed Field Day, 1 Sep. 2011, Oregon State University Madras AREC, Madras, OR.
- * du Toit, L.J. Starting a career in applied plant pathology. Invited seminar, Dept. of Plant Pathology, and the Forestry and Biotechnology Institute, University of Pretoria, 24 Mar. 2011, Pretoria, South Africa. Visited with faculty, postdoctorates, and graduate students, 24-25 Mar. 2011.
- 2010 (6) * du Toit, L.J. Managing diseases in onion bulb crops in the Ceres Valley/Kouebokkeveld, South Africa. Invited presentation and discussion with KORKOM onion and potato growers' association, 3 Dec. 2010, Ceres, South Africa.
- * du Toit, L.J. Soilborne diseases of onion. Invited presentation. Plant Pathology Short Course on Vegetables, 24-26 Nov. 2010, University, of Stellenbosch Stellenbosch, South Africa.
- * du Toit, L.J. Downy mildew, Botrytis leaf blight, and purple blotch of onion. Invited presentation. Plant Pathology Short Course on Vegetables, 24-26 Nov. 2010, University of Stellenbosch, Stellenbosch, South Africa.
- * du Toit, L.J. Vegetable seedborne diseases. Invited presentation. Plant Pathology Short Course on Vegetables, 24-26 Nov. 2010, University of Stellenbosch, Stellenbosch, South Africa.
- * du Toit, L.J. Bacterial diseases of bean seed crops of phytosanitary concern in Washington State. Columbia Basin Crop Consultants' Association (CBCCA), 6 May 2010, Moses Lake, WA.
- * Inglis, D.A., Koike, S.T., and du Toit, L.J. Soilborne diseases in coastal climates: Case studies on seed and specialty crops in the Skagit and Salinas Valleys. Opening Symposium, 56th Soil Fungus Conference, 22-24 Mar. 2010, Mount Vernon, WA. http://soilfungus.ars.usda.gov/Mount%20Vernon_2010/index.htm
- 2009 (10) * du Toit, L.J. Spinach seed production. Teddy E. Morelock International Spinach Conference, 11-12 Nov. 2009, Fayetteville, AR. <http://spinach.uark.edu/details.html>
- * du Toit, L.J. Invited seminar titled 'Vegetable Seed Production in the Pacific Northwest: Developing Integrated Disease Management Programs' to Dept. of Plant Pathology, University of Arkansas, 13 Nov.

- 2009, Fayetteville, AR. Lunch discussion with graduate students on my program & careers in plant pathology.
- * du Toit, L.J. Invited seminar titled ‘Vegetable Seed Production in the Pacific Northwest: Developing Integrated Disease Management Programs’ to Dept. of Plant Pathology, North Carolina State University, 19 Oct. 2009, Raleigh, NC. Lunch discussion with graduate students on my program & careers in plant pathology.
 - * du Toit, L.J. Invited seminar titled ‘Vegetable Seed Production in the Pacific Northwest’ to Dept. of Plant Pathology, University of California, Davis. 18 May 2009, Davis, CA. Lunch discussion with graduate students to discuss my program & careers in plant pathology.
 - * du Toit, L.J. Invited seminar titled ‘Vegetable Seed Pathology in the Pacific Northwest’ to Dept. of Horticulture, Oregon State University, 12 May 2009, Corvallis, OR.
 - * du Toit, L.J. Invited seminar titled ‘Vegetable Seed Production: Where? Why? How?’ to Biology Dept., Western Washington University, 11 Mar. 2009, Bellingham, WA.
 - * du Toit, L.J. Invited to discuss diseases & other issues affecting production of brassica vegetable seed crops and oilseed brassica crops in western Washington, requested by Specialty Seed Growers of Western Oregon in joint meeting with Oregon Dept. of Agriculture, Oregon State University researchers, and canola oilseed growers/crush operators in Willamette Valley, Oregon, 27 Feb. 2009, Salem, OR.
 - * du Toit, L.J. Invited presentation titled ‘Pacific Northwest disease control practices in spinach seed crops’, Specialty Seed Growers’ Meeting, sponsored by the Willamette Valley Specialty Seed Association and the Specialty Seed Growers of Western Oregon, 19th Feb. 2009, Albany, OR.
 - * du Toit, L.J. Invited research presentation titled ‘Selected seedborne pathogens of carrot and spinach’, International Seed Health Initiative – Vegetable Technical Group Meeting, 3-5 Feb. 2009, Paris, France.
- 2008 (9) * du Toit, L.J. Two invited presentations to onion seed growers/field reps of the Saad Forum, Klein Karoo, South Africa, and toured onion seed crops with field reps and 3 plant pathologists from the University of Stellenbosch to assist with disease diagnoses, 25-26 Nov. 2008, Oudtshoorn, South Africa. Presentations: ‘*Iris yellow spot virus* of onion’ and ‘Bacterial pathogens of onion’. Worked with Saad Forum members to develop a diagnostic plan with the Univ. of Stellenbosch for seed crop diseases.
- * du Toit, L.J. Invited presentation to onion bulb growers in Ceres Valley, South Africa, and visited onion bulb crops with an agronomist and 3 plant pathologists from the University of Stellenbosch to assist with diagnoses, 27 Nov. 2008. Presentation: ‘Fusarium basal rot and white rot of onion’.
 - * du Toit, L.J. Vegetable seed production in the Pacific Northwest USA: Developing integrated disease management programs. Invited presentation to the Western Branch of the Southern African Society for Plant Pathologists, 28 Nov. 2008, Stellenbosch, South Africa.
 - * du Toit, L.J. Disease management in spinach seed crops. Invited presentation at the 2008 Spinach Field Day, Aarhus University, 2 Jul. 2008, Slagelse, Denmark. Spent 4 days meeting with seed crop researchers at Aarhus University, vegetable seed growers, and seed company personnel in Denmark.
 - * du Toit, L.J. Seeds sown and harvests reaped: Vegetable seed pathology at Washington State University. One of two invited speakers at the Sixth Annual Plant Pathology Departmental Retreat at Iowa State University, 30 May 2008, McFarland Park, Ames, IA. Met with faculty and graduate students to discuss vegetable seed pathology, starting an academic career, etc.
 - * du Toit, L.J. Integrated disease management in spinach seed crops in the USA. 3 hour seminar at a Spinach Workshop following the 2008 DanSeed Symposium, 28 Feb. 2008, Aarhus University, Slagelse, Denmark. Presentation given by videoconference from Mount Vernon, WA.
 - * du Toit, L.J. Disease management in vegetable seed crops. Short Course preceding the 5th Organic Seed Conference, 13 Feb. 2008, Salem, OR.
 - * du Toit, L.J. Getting personal with vegetable diseases: From field monitoring to diagnosis. 3 hour Pre-Short Course Workshop, Columbia Basin Crop Consultants’ Assoc., 23 Jan. 2008, Moses Lake, WA.
 - * du Toit, L.J. Little known and evolving vegetable diseases in Washington State. 2008 Short Course of the Columbia Basin Crop Consultants’ Association, 24-25 Jan. 2008, Moses Lake, WA.
- 2007 (3) * du Toit, L.J. Managing foliar disease in vegetable seed crops. Pages 1-6, In: Proceedings of New Zealand Foundation for Arable Research International Conference, 24-26 Jul. 2007, Christchurch, New Zealand. Keynote speaker.
- * du Toit, L.J. Growing quality seed. Proceedings of the New Zealand Foundation for Arable Research International Conference, 24-26 Jul. 2007, Christchurch, New Zealand. Keynote speaker. Also consulted with vegetable seed growers and seed company field managers from Midlands Seeds Ltd and South

- Pacific Seeds NZ regarding management of diseases in small-seeded vegetable seed crops, 23 Jul. 2007, Canterbury Plains, South Island, New Zealand.
- * du Toit, L.J. Factors that favor infection of seed and transmission of seedborne pathogens. Organic Spinach Seed Winter Workshop, Organic Seed Alliance USDA WSARE project, 8-9 Feb. 2007, Mount Vernon, WA.
- 2006 (5) * du Toit, L.J. Spinach spoilers: Some foliar diseases of economic importance. 2006 Annual Conference of the British Leafy Salad Association, 22 Nov. 2006, Peterborough, England.
- * du Toit, L.J. Invited by Pop Vriend Seeds B.V., Germain's Technology Group, & Tozer Seeds to give a presentation & discuss seedborne diseases of spinach, 23 Nov. 2006, Camden, England.
 - * du Toit, L.J. Spinach diseases: Field identification, implications, and management practices. Organic Seed Alliance Spinach Seed Field Day, 23 May 2006, Sequim, WA.
<http://www.seedalliance.org/uploads/pdf/SpinachDiseases.pdf>
 - * du Toit, L.J. *Iris yellow spot virus* in onions. What is it? Where is it? What can we do about it? 55th Annual Muck Vegetable Growers' Conference, 22-23 Mar. 2006, Bradford, Ontario, Canada.
 - * du Toit, L.J. Seedborne diseases. Organic Seed Growers' Conference, 19 Feb. 2006, Victoria, B.C., Canada.
- 2005 (13) * du Toit, L.J. Invited by A S Wilcox & Sons Ltd and Seminis Vegetable Seeds to consult with vegetable & seed growers, company reps, breeders, & consultants in New Zealand. Seminars presented on onion production in Washington, and neck rot and *iris yellow spot virus* of onion, to onion growers in Pukekohe on 14 Dec. 2005, and to the Southern Packers in Ashburton on 23 Dec. 2005. Participated in disease management discussions and field tours of onion and vegetable seed crops.
- * du Toit, L.J. Vegetable seed crop disease research in Washington State. Seminar to researchers, breeders, and growers at New Zealand Crop & Food, 22 Dec. 2005, Lincoln, New Zealand.
 - * du Toit, L.J. Iris yellow spot of onion. Great Lakes Expo: Fruit, Vegetable and Farm Market, 7-9 Dec. 2005, Grand Rapids, MI. <http://www.glexpo.com/abstracts/2005abstracts/onion.pdf>
 - * du Toit, L.J. Seedborne diseases of carrot. Great Lakes Expo: Fruit, Vegetable and Farm Market, 7-9 Dec. 2005, Grand Rapids, MI. <http://www.glexpo.com/abstracts/2005abstracts/carrot.pdf>
 - * du Toit, L.J. Efficacy of bactericides for management of bacterial blight in carrots. Annual meeting of the Pacific Northwest Vegetable Association, 16-17 Nov. 2005, Pasco, WA.
 - * du Toit, L.J. IYSV in Washington: Current Status and Future Prospects. Annual meeting of the Pacific Northwest Vegetable Association, 16-17 Nov. 2005, Pasco, WA.
 - * du Toit, L.J. Diseases of vegetable seed crops: Biology and management. Organic Spinach Seed Field Day organized by the Organic Seed Alliance, 21 Jul. 2005, Sequim, WA.
 - * du Toit, L.J. Disease-free carrot seed: Is it a concern? Is it a possibility? 54th Annual Muck Vegetable Growers' Conference, 6-7 Apr. 2005, Bradford, Ontario, CANADA.
 - * du Toit, L.J. Neck rot of onion: What's the story? 54th Annual Muck Vegetable Growers' Conference, 6-7 Apr. 2005, Bradford, Ontario, CANADA.
 - * du Toit, L.J. *Iris yellow spot virus* in onion bulb and seed crops in the Pacific Northwest. 45th Annual meeting of the Idaho/Malheur County Onion Growers, 1 Feb. 2005, Ontario, OR.
 - * du Toit, L.J. *Iris yellow spot virus* in onion bulb and seed crops in the Pacific Northwest. Annual meeting of the Central Oregon Farm Fair & Trade Show, 2 Feb. 2005, Madras, OR.
 - * du Toit, L.J. Leaf spot and Verticillium wilt in spinach seed production. Pop Vriend Spinach Field Day, 18 Oct. 2005, King's City, CA.
- 2004 (2) * du Toit, L.J. Diseases in vegetable seed crops: Identification, biology, and management. Organic Seed Growers' Conference, 9-11 Jan. 2004, Corvallis, OR.
<http://www.seedalliance.org/uploads/pdf/VegSeedDiseases.pdf>
- * du Toit, L.J. Iris yellow spot of onions. 31st Annual Hermiston Farm Fair & Trade Show, 1-3 Dec. 2004, Hermiston, OR.
- 2003 (12) * Derie, M.L., and du Toit, L.J. Bacterial blight in seed carrots: Biology and management. Pacific Northwest Vegetable Association Annual Convention, 19-20 Nov. 2003, Pasco, WA.
- * du Toit, L.J. Aspergillus black mold: Can it be managed? Pacific Northwest Vegetable Association Annual Convention, 19-20 Nov. 2003, Pasco, WA.
 - * du Toit, L.J. Botrytis gray mold studies in onion seed. Pacific Northwest Vegetable Association Annual Convention, 19-20 Nov. 2003, Pasco, WA.
 - * du Toit, L.J. Bacterial blight and carrot seed quality. Great Lakes Expo: Fruit, Vegetable and Farm Market, 9-11 Dec. 2003, Grand Rapids, MI.

- * du Toit, L.J. Gray mold, black mold, and onion seed quality. Great Lakes Expo: Fruit, Vegetable and Farm Market, 9-11 Dec. 2003, Grand Rapids, MI.
- * du Toit, L.J. Management of vegetable diseases in the Pacific Northwest. Washington Tilth Producers' Annual Conference, 7-9 Nov. 2003, Bellingham, WA.
- * du Toit, L.J. Systematic approach to diagnosing plant ailments. Washington Tilth Producers' Annual Conference, 7-9 Nov. 2003, Bellingham, WA.
- * du Toit, L.J., and Miller, T.W. Evaluation of mustard cover/biofumigant crops for management of weeds and Fusarium wilt in spinach seed production. Washington Tilth Producers' Annual Conference, 7-9 Nov. 2003, Bellingham, WA.
- * du Toit, L.J. Using fungicides in vegetable and vegetable seed crops. Lower Columbia Basin Fieldmen Dealers' Association, 19 Nov. 2003, Pasco, WA.
- * du Toit, L.J., Crowe, F., Derie, M.L., Bafus, R., and Pelter, G.Q. Bacterial blight in seed carrots. Central Oregon Farm Fair and Central Oregon Vegetable Seed Production Conference, 5 Feb. 2003, Madras, OR.
- * du Toit, L.J., Derie, M.L., and Pelter, G.Q. *Botrytis* control in seed onions. Central Oregon Farm Fair and Central Oregon Vegetable Seed Production Conference, 5 Feb. 2003, Madras, OR.
- * Schafer, J., du Toit, L.J., and Derie, M.L. Leaf spot of spinach seed crops in western Washington, USA: Research report. Leafy Salads Conference, Pop Vriend and Tozer Seeds Limited, 25-26 Mar. 2003, Murcia region of southern Spain. *Report presented by Schafer for du Toit because immigration application process prevented du Toit leaving USA that year.*
- 2002 (1) * du Toit, L.J. Washington's Small-Seeded Vegetable Seed Industry: Seeds Sown and Harvests Reaped. Seminar presented to Department of Botany and Plant Pathology, Michigan State University, 4 Nov. 2002, Lansing, MI.
- 2001 (3) * du Toit, L.J. Diseases of Allium crops. Part of a 4-hour workshop, Diagnosis of Vegetable Diseases. Annual Meeting of the American Phytopathological Society, 25 Aug. 2001, Salt Lake City, UT.
 - * du Toit, L.J. From common smut of sweet corn to vegetable seed pathology: *Ustilago zaeae* to *Alternaria brassicae*. Seminar presented to Department of Plant Pathology, University of Florida, Gainesville, FL, 31 Jan. 2001.
 - * du Toit, L.J. Washington's small-seeded vegetable seed industry: Seeds sown and harvests reaped. Seminar presented to WSU Department of Plant Pathology, Pullman, WA, 22 Oct. 2001.
- 1999 (1) * du Toit, L.J. Smut rules? Seminar presented to the Department of Plant Pathology and the Forestry and Agricultural Biotechnology Institute, University of Pretoria, Pretoria, South Africa, 14 Dec. 1999.
- 1997 (2) * du Toit, L.J. Disease resistance: The key element of sweet corn IPM programs. APS Foundation's I.E. Melhus Graduate Student Speaker Award for the colloquium "IPM as a Central Component of Host Resistance", 1997 APS Annual Meeting, 9-13 Aug., Rochester, New York.
 - Pataky, J.K., Raid, R.N., du Toit, L.J., and Schueneman, T.J. Reactions of *sh2* sweet corn hybrids to northern leaf blight in Florida and Illinois. APS Southern Division Annual Meeting, 1997.

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- 2017 (4) * du Toit, L.J. 2017. Downy mildew in onion seed crops. Columbia Basin Vegetable Seed Assoc. Annual Meeting, 1 Feb. 2017, Moses Lake, WA. (85 people)
 - Weber, J., and du Toit, L.J. White mold in sunflower seed crops. Columbia Basin Vegetable Seed Assoc. Annual Meeting, 1 Feb. 2017, Moses Lake, WA. (85 people)
 - * Derie, M.L., and du Toit, L.J. 2017. *Phoma betae* in table beet and Swiss chard seed crops in western Washington. Puget Sound Seed Growers' Association Annual Meeting, 13 Jan. 2017, Mount Vernon, WA. (100 people)
 - Carmody, S.M., and du Toit, L.J. 2017. Light leaf spot and white leaf spot on brassicas in the Pacific Northwest. Puget Sound Seed Growers' Association Annual Meeting, 13 Jan. 2017, Mount Vernon, WA. (100 people)
- 2016 (8) * du Toit, L.J. 2016. Spinach Fusarium wilt: Management of a tenacious, soilborne pathogen based on Achilles' heel. 2016 International Spinach Conference, 29 Nov.–1 Dec. 2016, San Antonio, TX. See Abstracts above. (100 people)
 - * du Toit, L.J., Waters, T.W., Derie, M.L., Henrichs, B.A., and Holmes, B.J. 2016. Assessing the potential value of mycorrhizal inoculants in onion production in the Columbia Basin of Washington, USA. National Onion Association Convention and National Allium Research Conference, 30 Nov. – 3 Dec. 2016, Savannah, GA. See Abstracts above. (100 people)

- * du Toit, L.J. Carrot diseases in the Pacific Northwest. Pacific Northwest Vegetable Association Annual Convention & Trade Show, 16-17 Nov. 2016, Kennewick, WA. (100 people)
- * du Toit, L.J. Evaluation of arbuscular mycorrhizae in commercial onion fields. Pacific Northwest Vegetable Association Annual Convention & Trade Show, 16-17 Nov. 2016, Kennewick, WA. (150 people)
- * du Toit, L.J. Market opportunities for organic production in the PNW. Represented WSU in a 90 minute panel discussion with representatives from Charlie's Produce, Costco, Oregon Dept. of Agriculture, Oregon Tilth, Walmart, Whole Foods, Washington State Dept. of Agriculture. Pacific Northwest Vegetable Association Annual Convention & Trade Show, 16-17 Nov. 2016, Kennewick, WA. (150 people)
- * du Toit, L.J. Bacterial blight of table beet and Swiss chard: Efforts to quantify seedborne inoculum thresholds. Puget Sound Seed Growers' Association Annual Meeting, 29 Jan. 2016, Mount Vernon, WA. (50 people)
- * Carmody, S., and du Toit, L.J. Seedborne inoculum for light leaf spot and white leaf spot of brassicas in the Pacific Northwest: Potential significance and management. Puget Sound Seed Growers' Association Annual Meeting, 29 Jan. 2016, Mount Vernon, WA. (50 people)
- Simon, P., Colley, M., McKenzie, L., Zystro, J., McCluskey, C., Hoagland, L., Roberts, P., Colquhoun, J., du Toit, L., Nunez, J., Silva, E., and Waters, T. CIOA: The Carrot Improvement for Organic Agriculture Project. Better carrots for organic growers and U.S. consumers. 8th Organic Seed Growers' Conf., 4-6 Feb. 2016, Corvallis, OR. (50 people)
- 2015 (2) * du Toit, L.J. Onion internal dry scale: An emerging problem associated with climate change in the Pacific Northwest? W2008 Multi-state project annual meeting, 10 Dec. 2015, Salt Lake City, UT. (25 people)
- * du Toit, L.J. Ignorance is bliss? History repeated for brassica black leg in the Pacific Northwest. Brown bag lunch seminar at WSU Mount Vernon NWREC, 21 May 2015, Mount Vernon, WA. (60 people)
- 2014 (6) Collins, B.D., du Toit, L.J., Westerveld, S.M., and McDonald, M.R. Suppression of Fusarium wilt of spinach with chemical and biological fumigants. VIII International Symposium on Chemical & Non-Chemical Soil & Substrate Disinfestation. 13-18 July 2014, Turin, Italy. Poster presentation.
- * du Toit, L.J. Management of Fusarium and Verticillium wilts in spinach seed production: Research update. Puget Sound Seed Growers' Association Annual Meeting, 20 Feb. 2014, Mount Vernon, WA. (~50 people)
- * du Toit, L.J. *Phomopsis* and spinach seed: Progress report. Presentations made during: 1) Phytosanitary Committee Meeting, and 2) Emerging Disease Issues Committee Meeting at the 53rd American Seed Trade Association Vegetable & Flower Seed Conference, 26-28 Jan. 2013, Monterey, CA. (~50 seed industry people/committee meeting).
- * Christianson, E., and du Toit, L.J. Screening carrot germplasm for resistance to bacterial blight. Columbia Basin Vegetable Seed Association Annual Meeting, 21 January 2013, Moses Lake, WA. (75 people)
- * du Toit, L.J. Does this product really work? Distinguishing sound science from hot air in product promotional materials. Columbia Basin Vegetable Seed Association Annual Meeting, 21 Jan. 2013, Moses Lake, WA. (~75 people)
- * du Toit, L.J. Evaluating late-season bactericide applications for bacterial blight management in carrot seed crops. Columbia Basin Vegetable Seed Association Annual Meeting, 21 Jan. 2013, Moses Lake, WA. (~75 people)
- 2013 (7) * du Toit, L.J. Evaluation of Proline for management of Fusarium wilt in spinach seed crops. Puget Sound Seed Growers' Annual Meeting, 25 Jan. 2013, Mount Vernon, WA. (~75 people)
- * du Toit, L.J. Management of *Verticillium* in spinach: Research report. Puget Sound Seed Growers' Annual Meeting, 25 Jan. 2013, Mount Vernon, WA. (~75 people)
- * Gatch, E.W., and du Toit, L.J. Management of Fusarium wilt in spinach seed crops. Puget Sound Seed Growers' Annual Meeting, 25 Jan. 2013, Mount Vernon, WA. (~75 people)
- * du Toit, L.J. Disease management in onion seed crops: What? When? How? Columbia Basin Vegetable Seed Association Annual Meeting, 15 Jan. 2013, Moses Lake, WA. (~70 people)
- * du Toit, L.J. Disease management in carrot seed crops: What? When? How? Columbia Basin Vegetable Seed Association Annual Meeting, 15 Jan. 2013, Moses Lake, WA. (~70 people)
- Gatch, E.W. and du Toit, L.J. Shifts in soil microbial community associated with limestone-mediated suppression of spinach Fusarium wilt. 59th Conference on Soilborne Plant Pathogens, 26-28 Mar. 2013, Corvallis, OR. (~75 people)

- Udquim, K.-I. T., Arif, M., du Toit, L.J., and Schroeder, B.K. 2013. Detection and discrimination of *Botrytis* species, causal agents of onion bulb rot, using quantitative polymerase chain reaction (qPCR) melting curve analysis. The Summer 2013 Undergraduate Research Poster Symposium at Washington State University, The Office of Undergraduate Research, 2 Aug. 2013, Pullman, WA.
- 2012 (10) * Poudyal, D.S., du Toit, L.J., Paulitz, T., Porter, L., Eggers, J., and Hamm, P. Onion stunting caused by *Rhizoctonia*: Management and economic importance in the Columbia Basin of Oregon and Washington. Pp. 68-77 in: Proceedings of the 2012 National Allium Research Conference, 12-14 Dec. 2012, Las Cruces, NM. <http://aces.nmsu.edu/narc2012/index.html>
- * Alcalá, A.C., Porter, L.D., and du Toit, L.J. Evaluating methods for management of damping-off in organic pea production. Pacific Northwest Vegetable Association 26th Annual Conference & Trade Show, 14-15 November 2012, Kennewick, WA.
- * du Toit, L.J. Managing *Rhizoctonia* in vegetable crops. Pacific Northwest Vegetable Association 26th Annual Conference & Trade Show, 14-15 November 2012, Kennewick, WA.
- * du Toit, L.J., and Poudyal, D.S. *Rhizoctonia* control in dry bulb onions. Pacific Northwest Vegetable Association 26th Annual Conference & Trade Show, 14-15 November 2012, Kennewick, WA.
- * du Toit, L.J. Management of *Verticillium* in spinach: Research report. Puget Sound Seed Growers' Association Annual Meeting, 27 Jan. 2012, Mount Vernon, WA.
- * Gatch, E.W., and du Toit, L.J. Fusarium wilt management and risk assessment in spinach seed crops. Puget Sound Seed Growers' Association Annual Meeting, 27 Jan. 2012, Mount Vernon, WA.
- * du Toit, L.J. *Rhizoctonia* in onion bulb crops: Evaluation of field management practices. Columbia Basin Crop Consultants Association Annual Short Course, 18 Jan. 2012, Moses Lake, WA.
- * du Toit, L.J. Through the looking glass: A sabbatical perspective on vegetable production in South Africa. Columbia Basin Crop Consultants Association Annual Short Course, 18 Jan. 2012, Moses Lake, WA.
- * du Toit, L.J. Steps towards effective management of *Botrytis* in onion seed crops. Columbia Basin Vegetable Seed Association Annual Meeting, 17 Jan. 2012, Moses Lake, WA.
- * du Toit, L.J. Through the looking glass: A sabbatical perspective on vegetable seed production in South Africa. Columbia Basin Vegetable Seed Association Annual Meeting, 17 Jan. 2012, Moses Lake, WA.
- 2011 (7) * du Toit, L.J., Derie, M.L., Johnson, K.B., and Temple, T. Quantitative molecular detection of *Xanthomonas hortorum* pv. *carotae* in carrot seed before and after hot water treatment. 35th International Carrot Conference, 30 Nov.– 2 Dec. 2011, Johannesburg, South Africa. <http://www.carrotconference.co.za/>
- * Alcalá, A.C., Porter, L.D., and du Toit, L.J. Evaluation of organic seed and drench treatments for damping-off in organic pea crops. Pacific Northwest Vegetable Association Annual Conference & Trade Show, 16-17 Nov. 2011, Kennewick, WA. <http://www.pnva.org/>
- * du Toit, L.J. Management of seedborne diseases. Pacific Northwest Vegetable Association Annual Conference & Trade Show, 16-17 Nov. 2011, Kennewick, WA. <http://www.pnva.org/>
- * du Toit, L.J. Onion diseases of sporadic occurrence in the Columbia Basin. Pacific Northwest Vegetable Association Annual Conference & Trade Show, 16-17 Nov. 2011, Kennewick, WA. <http://www.pnva.org/>
- * du Toit, L.J. *Rhizoctonia* in onion bulb crops: Evaluation of field management practices. Pacific Northwest Vegetable Association Annual Conference & Trade Show, 16-17 Nov. 2011, Kennewick, WA. <http://www.pnva.org/>
- * du Toit, L.J. Through the looking glass: Perspectives from a sabbatical in South Africa. Seminar presented to WSU Dept. of Plant Pathology, 26 Oct. 2011, Pullman, WA.
- * du Toit, L.J. Sabbatical in South Africa. Seminar presented at WSU Mount Vernon NWREC, 12 May 2011, Mount Vernon, WA.
- 2010 (10) * Handiseni, M., Paulitz, T., and du Toit, L.J. Evaluation of management practices for stunting of onion caused by *Rhizoctonia* species. 2010 Pacific Northwest Vegetable Association Conference & Trade Show, 17-18 Nov. 2010, Kennewick, WA.
- * du Toit, L.J. *Verticillium* and spinach seed treatments: Greenhouse vs. field conditions. Mid-year Meeting of the California Leafy Greens Research Program, 5 Oct. 2010, Seaside, CA.
- * du Toit, L.J. Seed treatments for management of *Verticillium* in spinach. Annual Meeting of the California Leafy Greens Research Program, 16 Mar. 2010, Harris Ranch, CA.
- * du Toit, L.J. Fusarium wilt in radish and spinach seed crops. Willamette Valley Specialty Seed Growers'

- Association, 26 Feb. 2010, Albany, OR.
- * du Toit, L.J. Management of *Verticillium* wilt in spinach seed crops. Willamette Valley Specialty Seed Growers' Association, 26 Feb. 2010, Albany, OR.
 - * du Toit, L.J. Fusarium wilt and *Verticillium* wilt in spinach seed production: What's new? Annual Seed Growers' Meeting for Alf Christianson Seed Co./Wilbur Ellis, 16 Feb. 2010, Burlington, WA.
 - * du Toit, L.J., and Gatch, E.W. Research progress report on Fusarium wilt in spinach seed crops. Annual Conference, Puget Sound Seed Growers' Association/Western Washington Agriculture Association, 29 Jan. 2010, Mount Vernon, WA.
 - * du Toit, L.J. Management of Fusarium wilt in radish seed crops. Annual Conference of the Columbia Basin Vegetable Seed Association, 20 Jan. 2010, Moses Lake, WA.
 - * du Toit, L.J. Infection of seed and transmission of seedborne pathogens. Annual Conference of the Columbia Basin Vegetable Seed Association, 20 Jan. 2010, Moses Lake, WA.
 - * du Toit, L.J. Managing diseases in vegetable crops. 2010 Short Course of the Columbia Basin Crop Consultants' Association, 15 Jan. 2010, Moses Lake, WA.
- 2009 (9) * du Toit, L.J., and Koike, S.T. *Verticillium* & spinach: Developing a standardized seed health assay. Teddy E. Morelock International Spinach Conference, 11-12 Nov. 2009, Fayetteville, AR.
<http://spinach.uark.edu/details.html>
- * du Toit, L.J. *Verticillium* & spinach: Identifying effective seed treatments. Teddy E. Morelock International Spinach Conference, 11-12 Nov. 2009, Fayetteville, AR. <http://spinach.uark.edu/details.html>
 - * du Toit, L.J. *Verticillium* in spinach: Seed testing and seed treatment evaluations. Midyear research presentation to the CA Leafy Greens Research Program, 13 Oct. 2009, Seaside, CA.
 - * du Toit, L.J. Efficacy of seed treatments for management of *Verticillium* in spinach. Annual Research Meeting of the California Leafy Greens Research Board, 17 Mar. 2009, Harris Ranch, CA.
 - * du Toit, L.J. Research report on vegetable seed crop diseases in western Washington. Annual Seed Growers' Meeting for Alf Christianson Seed Co./Wilbur Ellis, 25 Feb. 2009, Burlington, WA.
 - * du Toit, L.J. 2008 Research report on vegetable seed crop diseases in western Washington. Annual Conference of the Puget Sound Seed Growers' Association, 30 Jan. 2009, Mount Vernon, WA.
 - * du Toit, L.J. Efficacy of seed treatments for management of seedborne pathogens and seedling blights of onion. 2009 Short Course of the Columbia Basin Crop Consultants' Association, 22 Jan. 2009, Moses Lake, WA.
 - * du Toit, L.J. Powdery mildew in carrot seed crops: Impacts and management. Annual Conference of the Columbia Basin Vegetable Seed Association, 15 Jan. 2009, Moses Lake, WA.
 - * du Toit, L.J. Efficacy of seed treatments for management of seedborne pathogens and seedling blights of onion. Annual Conference of the Columbia Basin Vegetable Seed Association, 15 Jan. 2009, Moses Lake, WA.
- 2008 (11) * du Toit, L.J. Bacterial blight of carrot: Detection and management. Pacific Northwest Vegetable Association Annual Convention & Trade Show, 19 Nov. 2008, Kennewick, WA.
<http://www.pnva.org/files/files/duToit2008PNVA-CarrotBac.pdf>
- * du Toit, L.J. Carrot powdery mildew: Impacts and management. Pacific Northwest Vegetable Association Annual Convention & Trade Show, 19 Nov. 2008, Kennewick, WA.
<http://www.pnva.org/files/files/duToit2008PNVA-CarrotPow.pdf>
 - * du Toit, L.J. Efficacy of fungicide seed treatments for management of seedling blights of onion. Pacific Northwest Vegetable Association Annual Convention & Trade Show, 19 Nov. 2008, Kennewick, WA.
<http://www.pnva.org/files/files/duToit2008PNVA-OnionFcid.pdf>
 - * du Toit, L.J. Efficacy of spinach seed treatments for management of *Verticillium dahliae*. Midyear research presentation to the CA Leafy Greens Research Program, 14 Oct. 2008, Seaside, CA.
 - * du Toit, L.J. Western Washington vegetable seed crop diseases: 2007 research report. Wilbur-Ellis/Alf Christianson Seed Co. Seed Growers' Meeting, 5 Mar. 2008, Mount Vernon, WA.
 - * du Toit, L.J. Effect of powdery mildew on carrot seed production: 2007 research report. Annual Conference of the Columbia Basin Vegetable Seed Association, 17 Jan. 2008, Moses Lake, WA.
 - * du Toit, L.J. Evaluation of Actigard for control of IYSV in onion crops. Annual Conference of the Columbia Basin Vegetable Seed Association, 17 Jan. 2008, Moses Lake, WA.
 - * du Toit, L.J. Evaluation of Tanos, inoculum concentration, and timing of application on efficacy of copper hydroxide for control of bacterial blight of carrot. Annual Conference of the Columbia Basin Vegetable Seed Association, 17 Jan. 2008, Moses Lake, WA.

- * du Toit, L.J. 2007 Status of IYSV in onion bulb and seed crops in Washington, and evaluation of Actigard for management of IYSV in bulb crops. Annual meeting of the W1008 Multistate Project, 16 Jan. 2008, Denver, CO.
- * du Toit, L.J. Development of a quantitative DNA-based assay for the spinach Fusarium wilt pathogen. 98th Annual Convention of the Western Washington Horticulture Association, 9-10 Jan. 2008, Everett, WA.
- * du Toit, L.J., and Cummings, J.A. Evaluating the efficacy of organic seed and drench treatments for control of damping-off/seedling blight pathogens of spinach. 98th Annual Convention of the Western Washington Horticulture Association, 9-10 Jan. 2008, Everett, WA.
- 2007 (8) * du Toit, L.J. Evaluation of Actigard for control of *Iris yellow spot virus* in onion bulb crops. Annual Convention & Trade Show of the Pacific Northwest Vegetable Association, 13-14 Nov. 2007, Kennewick, WA.
- * du Toit, L.J. Powdery mildew of onion. Annual Convention & Trade Show of the Pacific Northwest Vegetable Association, 13-14 Nov. 2007, Kennewick, WA.
- * du Toit, L.J. Limestone amendments for suppression of Fusarium wilt in spinach seed crops in western Washington/Oregon. Annual Convention & Trade Show of the Pacific Northwest Vegetable Association, 13-14 Nov. 2007, Kennewick, WA.
- * du Toit, L.J. Evaluation of limestone amendments for control of Fusarium wilt in spinach seed crops in western Washington. Wilbur-Ellis/Alf Christianson Seed Co. Seed Growers' Meeting, 1 Mar. 2007, Mount Vernon, WA.
- * du Toit, L.J. Effect of powdery mildew on carrot seed production: 2006 Research report. Annual Conference of the Columbia Basin Vegetable Seed Association, 18 Jan. 2007, Moses Lake, WA.
- * du Toit, L.J. Evaluation of Actigard for control of IYSV in onion seed crops: 2006 Research report. Annual Conference of the Columbia Basin Vegetable Seed Association, 18 Jan. 2007, Moses Lake, WA.
- * Derie, M.L., and du Toit, L.J. Vegetable seed crop diseases: 2006 Research report. Western Vegetable Disease Conference, 9 Jan. 2007, Portland, OR.
- * du Toit, L.J., Volker, K., and Picha, G. Evaluation of plant growth regulators for control of secondary bloom in Brassica vegetable seed crops in western Washington. 97th Annual Convention of the Western Washington Horticulture Association, 3-4 Jan. 2007, SeaTac, WA.
- 2006 (8) * du Toit, L.J. Purple blotch or Stemphylium leaf blight of onion? Who cares? Annual Convention & Trade Show of the Pacific Northwest Vegetable Association, 15-16 Nov. 2006, Pasco, WA.
- * du Toit, L.J. Diseases of vegetable seed crops in western Washington: 2005 Research summary. Wilbur-Ellis and Alf Christianson Seed Co. Seed Growers' Meeting, 7 Mar. 2006, Mount Vernon, WA.
- * du Toit, L.J. Seedborne diseases: An overview. Skagit Farmers' Supply Annual Growers' Conference, 16 Feb. 2006, Mount Vernon, WA.
- * du Toit, L.J. *Iris yellow spot virus* in onion bulb and seed crops. Annual Conference of the Columbia Basin Vegetable Seed Association, 20 Jan. 2006, Moses Lake, WA.
- * du Toit, L.J. Bactericides in seed carrots. Annual Conference of the Columbia Basin Vegetable Seed Association, 20 Jan. 2006, Moses Lake, WA.
- * du Toit, L.J. 2005 Research on diseases of vegetable seed crops in Washington. Western Vegetable Disease Conference, 10 Jan. 2006, Portland, OR.
- * du Toit, L.J. Crucifer quarantine issues for western Washington: What are the issues? 96th Annual Convention of the Western Washington Horticulture Association, 4-5 Jan. 2006, SeaTac, WA.
- * du Toit, L.J. Fresh vegetable disease diagnosis. 96th Annual Convention of the Western Washington Horticulture Association, 4-5 Jan. 2006, SeaTac, WA.
- 2005 (3) * du Toit, L.J. Botrytis grey mold and IYSV research in seed onion. Annual Conference of the Columbia Basin Vegetable Seed Association, 20 Jan. 2005, Moses Lake, WA.
- * du Toit, L.J. *Xanthomonas* bacterial blight in seed carrot. Annual Conference of the Columbia Basin Vegetable Seed Association, 20 Jan. 2005, Moses Lake, WA.
- * du Toit, L.J. Diseases of vegetable seed crops in western Washington: 2004 Research summary. Seed Growers' Meeting for Alf Christianson Seed Co., 11 Mar. 2005, Mount Vernon, WA.
- 2004 (7) * du Toit, L.J. Disease research and management recommendations for spinach and brassica seed crops. Willamette Valley Specialty Seed Growers' Meeting, 30 Nov. 2004, Albany, OR.
- * du Toit, L.J. Diseases of vegetable seed crops in western Washington: 2003 Research summary. Seed

- Growers' Meeting for Alf Christianson Seed Co., 5 Mar. 2004, Mount Vernon, WA.
- * du Toit, L.J. Diseases of vegetable seed crops in western Washington: 2003 Research summary. Skagit Farmers' Supply Growers' Recertification Meeting, 18 Feb. 2004, Mount Vernon, WA.
 - * du Toit, L.J. Systematic approach to diagnosis of vegetable diseases. Western Washington Horticultural Association Annual Convention, 7-9 Jan. 2004, SeaTac, WA.
 - * du Toit, L.J., and Derie, M.L. Diseases of vegetable seed crops: 2003 Research summary. Western Vegetable Disease Conference, 13 Jan. 2004, Portland, OR.
 - * du Toit, L.J., Derie, M.L., and Pelter, G.Q. Bacterial blight in carrot seed crops. Annual Meeting of Columbia Basin Vegetable Seed Association, 20 Jan. 2004, Moses Lake, WA.
 - * du Toit, L.J., Derie, M.L., and Pelter, G.Q. Onion seed and Botrytis gray mold ... Research Progress. Annual Meeting of Columbia Basin Vegetable Seed Association, 20 Jan. 2004, Moses Lake, WA.
- 2003 (11)* Derie, M.L., and du Toit, L.J. Diseases of spinach and brassica seed crops: 2002 research report. 2003 Western Vegetable Disease Conference, 14 Jan. 2003, Portland, OR.
- * du Toit, L.J. Non-obligate foliar pathogens. Presentation and lab demonstration at the Leafy Vegetable Disease Diagnosis Workshop: Chenopodiaceous and Cruciferous Vegetables in Northwestern Washington, 24 Jul. 2003, Mount Vernon, WA.
 - * du Toit, L.J. Wilt pathogens and white mold. Presentation and lab demonstration at the Leafy Vegetable Disease Diagnosis Workshop: Chenopodiaceous and Cruciferous Vegetables in Northwestern Washington, 24 Jul. 2003, Mount Vernon, WA.
 - * du Toit, L.J. Virus diseases. Presentation and lab demonstration at the Leafy Vegetable Disease Diagnosis Workshop: Chenopodiaceous and Cruciferous Vegetables in Northwestern Washington, 24 Jul. 2003, Mount Vernon, WA.
 - * du Toit, L.J. Columbia Basin vegetable seed diseases. Columbia Basin Crop Consultants' Short Course. 16-17 Jan. 2003, Moses Lake, WA.
 - * du Toit, L.J. Diagnosing plant ailments. Columbia Basin Crop Consultants' Short Course. 16-17 Jan. 2003, Moses Lake, WA.
 - * du Toit, L.J. *Verticillium* in spinach seed production. Western Washington Seed Advisory Committee Meeting, 6 Mar. 2003, Mount Vernon, WA.
 - * du Toit, L.J., Crowe, F., Derie, M.L., Bafus, R., and Pelter, G.Q. The carrot seed bacterial blight project. Annual Meeting of Columbia Basin Vegetable Seed Association, 14 Jan. 2003, Moses Lake, WA.
 - * du Toit, L.J., Derie, M.L., and Pelter, G.Q. Botrytis gray mold studies in onion seed. Annual Meeting of Columbia Basin Vegetable Seed Association, 14 Jan. 2003, Moses Lake, WA.
 - * du Toit, L.J., and Derie, M.L. Disease research on vegetable seed crops in western Washington. Skagit Farmers' Supply Grower Recertification Meeting, 11 Feb. 2003, Mount Vernon, WA.
 - * du Toit, L.J., and Derie, M.L. Disease research on vegetable seed crops in western Washington. Alf Christianson Seed Co. Seed Growers' Meeting, 27 Feb. 2003, Mount Vernon, WA.
- 2002 (15) * du Toit, L.J. Bacterial leaf blight of carrots: A concern for the Columbia Basin? Annual Meeting of Columbia Basin Vegetable Seed Association, 15 Jan. 2002, Moses Lake, WA.
- * du Toit, L.J. Gray mold of seed onions. Annual Meeting of Columbia Basin Vegetable Seed Association, 15 Jan. 2002, Moses Lake, WA.
 - * du Toit, L.J. Brassica seed crop fungicide trials. Update Meeting of Syngenta Crop Protection, 20 Feb. 2002, Mount Vernon, WA.
 - * du Toit, L.J. Diseases of vegetable seed crops in Washington: Research report. Production Meeting of Bejo Seeds, Inc., 6 Feb. 2002, Pasco, WA.
 - * du Toit, L.J. Diseases of vegetable seed crops in Washington: Research report. Annual Meeting of Willamette Valley Specialty Seed Association, 7 Feb. 2002, Aurora, OR.
 - * du Toit, L.J. Fungicide trials on diseases of Brassica seed crops. 2002 Western Vegetable Disease Conference, 8 Jan. 2002, Portland, OR.
 - * du Toit, L.J. Leaf spot of spinach seed crops. 2002 Western Vegetable Disease Conference, 8 Jan. 2002, Portland, OR.
 - * du Toit, L.J. Neck rot of onion seed crops. 2002 Western Vegetable Disease Conference, Portland, OR.
 - * du Toit, L.J. Gray mold of seed onions. Annual Meeting of Western Oregon Onion Commission, 26 Feb. 2002, Salem, OR.
 - * du Toit, L.J. Management of vegetable diseases prevalent in the Pacific Northwest. Annual Meeting of Washington Tilth Producers' Association, 9 Nov. 2002, Yakima, WA.

- * du Toit, L.J., Crowe, F., Derie, M.L., Bafus, R., and Pelter, G.Q. Bacterial blight: Preliminary survey of carrot seed crops in the Pacific Northwest. 29th International Carrot Conference, 10-13 Feb. 2002, Bakersfield, CA.
- * du Toit, L.J., and Derie, M.L. Diseases of Brassica and spinach seed crops in western Washington: Research report. Annual Meeting of Puget Sound Seed Growers' Association, 20 Nov. 2002, Mount Vernon, WA.
- * du Toit, L.J., and Derie, M.L. Management of *Botrytis* in seed onions. Annual Meeting of Central Oregon Vegetable Seed Production Conference, 7 Mar. 2002, Madras, OR.
- * du Toit, L.J., and Derie, M.L. Stemphylium leaf spot of spinach seed crops. Annual Meeting of California Spinach Advisory Committee, 9 Oct. 2002, Salinas, CA.
- * du Toit, L.J., Derie, M.L., and Pelter, G.Q. *Botrytis* spp. associated with onion seed crops in Washington State. 2002 International Allium White Rot Conference, 6-8 Jun. 2002, Harris Ranch, CA.
- 2001 (6) * du Toit, L.J. Common smut of sweet corn. Annual Meeting of Columbia Basin Vegetable Seed Association, 16 Jan. 2001, Moses Lake, WA.
- * du Toit, L.J. Using fungicides in vegetable seed disease management. Annual Meeting of Columbia Basin Vegetable Seed Association, 16 Jan. 2001, Moses Lake, WA.
- * du Toit, L.J. Diseases of vegetable seed crops in western Washington: 2001 research report. Annual Meeting of Puget Sound Seed Growers' Association, 20 Nov. 2001, Mount Vernon, WA.
- * du Toit, L.J. Neck rot of onion seed crops: Research report. Columbia Basin Onion Field Day, 31 Aug. 2001, Royal Slope, WA.
- * du Toit, L.J. Neck rot of onions. Annual Meeting of Washington Pest Consultants' Association, 15-16 Nov. 2001, Yakima, WA.
- * du Toit, L.J. Using fungicides in vegetable seed disease management. Annual Meeting of Central Oregon Vegetable Seed Production Conference, 1 Mar. 2001, Madras, OR.
- 2000 (1) * du Toit, L.J. Plans for the vegetable seed pathology program at WSU-Mount Vernon. Annual Meeting of Puget Sound Seed Growers' Association, 8 Nov. 2000, Mount Vernon, WA.
- 1997 (1) * du Toit, L.J. Field infection studies on common smut of sweet corn. National Sweet Corn Breeders' Association Annual Meeting, 8-9 Dec. 1997, Chicago, IL.

Diagnosis reports (5)

- 2000 (3) * du Toit, L.J. Tree fruit diseases diagnosed at the WSU-Puyallup Plant & Insect Diagnostic Lab in 1999. 2000 Western Tree Fruit Disease Conference, 6 Jan. 2000, Portland, OR.
- * du Toit, L.J. Turf and ornamental diseases diagnosed at the WSU-Puyallup Plant & Insect Diagnostic Lab in 1999. 2000 Western Turf & Ornamental Disease Conference, 5 Jan. 2000, Portland, OR.
- * du Toit, L.J. Vegetable diseases diagnosed at the WSU-Puyallup Plant & Insect Diagnostic Lab in 1999. 2000 Western Vegetable Disease Conference, 4 Jan. 2000, Portland, OR.
- 1999 (2) * du Toit, L.J. Tree fruit diseases diagnosed at the WSU-Puyallup Plant & Insect Diagnostic Lab in 1998. 1999 Western Tree Fruit Disease Conference, 7 Jan. 1999, Portland, OR.
- * du Toit, L.J. Turf and ornamental diseases diagnosed at the WSU-Puyallup Plant & Insect Diagnostic Lab in 1998. 1999 Western Turf & Ornamental Disease Conference, 6 Jan. 1999, Portland, OR.

Pesticide education/recertification (5)

- 2013 * du Toit, L.J. Soilborne plant diseases: Fusarium and Verticillium wilts. WSU Urban IPM and Pesticide Safety Education Program: Private Applicator Shortcourse. 7 Nov. 2013, Mount Vernon, WA.
- 2004 * du Toit, L.J. Principles of plant disease management. Pesticide Safety Education and IPM, 2 Nov. 2004, Mount Vernon, WA.
- 2000 * du Toit, L.J. Getting to the roots of plant diseases. Portland Parks and Recreation, 30 Mar. 2000, Portland, OR.
- * du Toit, L.J. Getting to the roots of plant diseases. Pesticide Education Program, 16 Feb. 2000 in Kirkland, WA, & 9 Feb. 2000 in Mount Vernon, WA.
- 1999 * du Toit, L.J. Improve your diagnostic skills. Pesticide Education Program, 14 & 28 Jan. 1999, Tacoma, WA.

Introductory plant pathology, diagnosis, and/or disease management (21)

- 2008 * du Toit, L.J. A systematic approach to diagnosing plant problems. 3 hour workshop at Annual Conference

- of the Washington Tilth Producers' Association, 8 Nov. 2008, Bellingham, WA.
- 2006 * du Toit, L.J. Disease Diagnosis. Annual Meeting of Washington Tilth Producers' Association, 11 Nov. 2006, Vancouver, WA.
- * du Toit, L.J. Disease diagnosis: A systematic approach to diagnosing plant problems. Annual Convention & Trade Show of the Pacific Northwest Vegetable Association, 15-16 Nov. 2006, Pasco, WA.
- * du Toit, L.J. Principles of disease management. Skagit Co. Men's Garden Club, 5 Jan. 2006, Mount Vernon, WA.
- 2004 * du Toit, L.J. Diagnosis of plant problems. Salal Chapter of Washington Native Plant Society, 7 Feb. 2004, Mount Vernon, WA.
- 2002 * du Toit, L.J. Systematic approach to diagnosis of plant problems. Skagit Farmers' Supply: Growers' Recertification Meeting, 15 Feb. 2002, Mount Vernon, WA.
- * du Toit, L.J. Systematic approach to diagnosing plant problems. Workshop presented at Annual Meeting of Washington Tilth Producers' Association, 9 Nov. 2002, Yakima, WA.
- 2001 * du Toit, L.J. Systematic approach to diagnosing plant problems. Workshop presented at Annual Meeting of Washington Tilth Producers' Association, Olympia, WA. 10 Nov. 2001.
- 2000 * du Toit, L.J. Biology, diagnosis, and management of garden pests and diseases. Des Moines chapter of Washington State Federation of Garden Clubs, 27 Mar. 2000, Des Moines, WA.
- * du Toit, L.J. Biology and diagnosis of plant problems prevalent in western Washington. Seattle Tilth, 15 Jul. 2000, Seattle, WA.
- * du Toit, L.J. Biology, diagnosis, and management of plant problems. Workshop presented to horticulture students from South Seattle Community College, 17 Apr. 2000, Puyallup, WA.
- * du Toit, L.J. Diagnosis of plant problems prevalent in western Washington. Vashon Island Growers' Association, 25 Apr. 2000, Vashon Island, WA.
- * du Toit, L.J. Getting to the roots of plant diseases. Workshop presented as part of a public seminar series at South Seattle Community College, 22 Apr. 2000, Seattle, WA.
- * du Toit, L.J. Systematic approach to diagnosis of plant problems. 2000 Washington Tilth Producers' Conference, 10-11 Nov. 2000, Lake Chelan, WA.
- * du Toit, L.J. Systematic approach to diagnosis of plant problems. Annual Meeting of Washington State Farmers' Market Association, 28 Feb. 2000, Seattle, WA.
- * du Toit, L.J. Biology, diagnosis, and management of plant problems. Workshop presented to horticulture students from South Seattle Community College, 12 May 1999, Puyallup, WA.
- * du Toit, L.J. Diagnosis of plant problems. Sumner chapter of the Hill 'n Dale Garden & Trowel Club, 28 Sep. 1999, Sumner, WA.
- * du Toit, L.J. Systematic approach to plant problem diagnosis. 1999 Washington Tilth Producers' Conference, 12-14 Nov. 1999, Port Townsend, WA.
- * du Toit, L.J., and Copes, W.E. Practical in abiotic plant disorders: Nutritional disorders. Ornamentals Northwest Seminars, 26-28 Aug. 1999, Portland, WA.
- * du Toit, L.J. Plant problem diagnosis. Southwest Washington Small Farm & Garden Conference, 13 Mar. 1999, Centralia, WA.
- 1998 * du Toit, L.J. Fundamentals of plant disease development and diagnosis for control. Washington State Nursery and Landscape Association Annual Seminar, 4 Dec. 1998, Seattle, WA.

WSU Master Gardener training (>31)

- 2017 (1) * du Toit, L.J., and Gerdeman, B. Vegetable diseases and vegetable/fruit pests of the Pacific Northwest. 2-hour workshop for 2017 Pierce Co. Master Gardener Community Garden Specialist Training, 7 Mar. 2017, Tacoma, WA.
- 2008 (1) * du Toit, L.J., and Wisen, D. What's killing my plant? A step-by-step to diagnosing plant diseases. Advanced Master Gardeners' Know & Grow Workshop, 20 May 2008, Mount Vernon, WA.
- 2006 (1) * du Toit, L.J., and Hunt, M. Cabbages and kales: Flowers, food, & seed. Skagit Co. Advanced Master Gardeners' Know & Grow Workshop, 20 Jun. 2006, Mount Vernon, WA.
- 2003 (1) * du Toit, L.J. Systematic approach to diagnosing plant diseases. Skagit Co. Advanced Master Gardeners, 22 Apr. 2003, Mount Vernon, WA.
- 2002 (1) * du Toit, L.J. Managing plant diseases in spring and fall. Skagit Co. Advanced Master Gardeners, 18 Jun. 2002, Mount Vernon, WA.
- 1998-2000 * Introductory plant pathology, disease management, and plant problem diagnosis. Annual Basic and

Advanced Master Gardener training for each of 8 to 12 counties in western Washington, WSU Cooperative Extension. 6 hour workshops for class sizes ranging from 20 to 140 people.

Other (11 total)

- 2004 (1) * Eastwell, K.C., du Toit, L.J., Druffel, K., Pike, K.S., and Walsh, D.B. Etiology of 'black death' of *Helleborus* spp. Western Turf and Ornamental Disease Conference, 14 Jan. 2004, Portland, OR.
- 2000 (1) * du Toit, L.J. Diseases affecting the Christmas tree industry in the Puget Sound region. Puget Sound Christmas Tree Growers' Association, 18 Mar. 2000, Seattle, WA.
- 1999 (2) * du Toit, L.J. The latest on Christmas tree diseases. Puget Sound Christmas Tree Growers' Association, 20 Feb. 1999, Puyallup, WA.
- * du Toit, L.J. Small-scale organic apple production: Apple maggot. 1999 Washington Tilth Producers' Conference, 12-14 Nov. 1999, Port Townsend, WA.
- 1997 (2) * du Toit, L.J., and Pataky, J.K. Practical plant pathology in a high-tech world: Disease nurseries. 35th Congress of Southern African Society for Plant Pathology, Badplaas, South Africa, 19-22 Jan. 1997.
- * du Toit, L.J., and Pataky, N.R. Practical plant pathology in a high-tech world: Plant clinics. 35th Congress of Southern African Society for Plant Pathology, Badplaas, South Africa, 19-22 Jan. 1997.
- 1993 (1) * du Toit, L.J. Why were soybean seedling blights so severe in Illinois in 1992? 1993 Illinois Agricultural Pesticides Conference, Cooperative Extension Service, UIUC, Jan. 6-7, 1993.
- 1992 (1) * du Toit, L.J., and Laing, M.D. Searching for a Rapid, Inexpensive and Qualitative Aflatoxin Analysis. 30th National Plant Pathology Congress, Cintsu West, Ciskei, South Africa, Jan. 1992.
- 1991 (3) * du Toit, L.J. How to analyze for aflatoxins. Mycotoxin Symposium, University of Natal, Durban, South Africa, Aug. 1991.
- * du Toit, L.J., Jarman, D., Laing, M.D., Paddy, A. The Effect of pH on the Efficiency of Three Copper Fungicides at Controlling Cabbage Downy Mildew. 29th National Plant Pathology Congress, University of Natal, Pietermaritzburg, South Africa, Jan. 1991.
- * du Toit, L.J., and Laing, M.D. Control of pre- and postharvest aflatoxin contamination of groundnuts using an experimental chemical. Symposium of Natal Branch of South African Society of Microbiologists, UNP, South Africa, Oct. 1991.

WORKSHOPS, FIELD DAYS, TOURS & OTHER OUTREACH PROGRAMS (>162, see also **Invited presentations above)**

- 2017 (7) du Toit, L.J., Vincelli, P., and Gadoury, D.M. Committees: How to be effective. Organized 1-hour session for APS committee chairs and vice-chairs at 2017 APS Annual Meeting, 9 Aug. 2017, San Antonio, TX. (xx people)
- Washington Pest Control Tour of the Washington State Commission on Pesticide Registration, western WA, 17-19 Jul. 2015. Presented on vegetable seed production and research needs, including pathology research, to ~60 federal/state legislators or staff, agricultural industry representatives, WA State Depts. of Agriculture, Ecology, and Labor & Industries; WSU CAHNRS administrators, National Marine Fisheries Service, US Environmental Protection Agency, etc. on 18 Jul. in Mount Vernon, WA.
- du Toit, L.J., Vincelli, P., and Gadoury, D.M. APS Subject Matter and General Policy Committees. 1-hour webinar on the logistics of committee function and meetings to chairs and vice-chairs of 37 committees of the American Phytopathological Society, 26 Jun. 2017. Recording?
- Spinach Seed Health Assay Workshop in Denmark and the Netherlands: Invited to present a 4-hour lab workshop on spinach seed health testing at Aarhus University, Denmark on 7 Jun. 2017 (20 people). Workshop preceded by a tour of spinach seed crops in Denmark on 6 Jun. with spinach seed growers and personnel from all seed companies growing spinach seed in Denmark (35 people). Repeated the workshop at Pop Vriend Seeds, Andijk, the Netherlands on 9 Jun. 2017 (10 people, including 2 plant pathologists from Italy). Workshop preceded on 8 Jun. by presentations on the biology and management of necrotrophic fungal pathogens of spinach (30 people).
- 2-week volunteer project with the Farmer-2-Farmer program of the US Agency for International Development (USAID), assisting onion farmers in the mountainous Sacapulas region of Quiche, in northwestern Guatemala, with disease diagnoses and management recommendations, 13-25 Mar. 2017. Trained ~15 USAID Technical Field Assistants and regional farmers.
- 8th Annual Spinach Fusarium Wilt Soil Bioassay Open House, WSU Mount Vernon NWREC. Open house for spinach seed growers and seed company personnel to observe spinach parent lines ranging from highly

- susceptible to partially resistant fare in a bioassay test of soil sampled from growers' fields to assess the relative risk of Fusarium wilt. Soil samples (5 gal/field) were received from 33 growers' fields in Dec. 2016 (\$200/field) and processed, as well as seed of 18 spinach parent lines from seed companies to screen for relative resistance to Fusarium wilt. Stakeholders view their soils in Feb. 2017 to make decisions on which fields to select for planting spinach seed crops in 2017. >270 fields in western WA have been tested since 2010.
- Gave tours of WSU Mount Vernon NWREC and/or vegetable seed crops in Washington, and discussed vegetable seed production and seed pathology with various public and private groups including: Bejo Zaden group (5 people, 20 Feb.); Lucy Stewart, USDA ARS virologist from Ohio State University (24 Feb.); Arwin Vriend, Pop Vriend Seed Co., the Netherlands (5 Jul.); Dr. Rina Kamenetsky, Dr. Elnat Shemesh Mayer, and Prof. Haim Rabinowitch, Volani Institute, Israel (7 Jul.).
- 2016 (12) Club root of brassicas. Cloud Mountain Farm Center 2016 Farmer Speaker Series, 20 Oct. 2016. A 2-hour workshop for farmers, including hands-on microscope experience, on club root of brassica crops. Taught with Chris Benedict, WSU Whatcom Co. Extension Specialist. Everson, WA. (12 people)
- WSU Extension Onion Field Day, 25 Aug. 2016, Skone & Connorr Farm, Othello, WA. Presented onion downy mildew, mycorrhizae, internal dry scale, bacterial bulb rots, and *Iris yellow spot virus* information and research updates to growers, seed industry, extension personnel, researchers, etc. (90 people).
- Washington Pest Control Tour of the Washington State Commission on Pesticide Registration, central WA, 27 Jul. 2016. Presented on vegetable seed production and research needs, including pathology research, to federal/state legislators or staff, agricultural industry representatives, WA State Depts. of Agriculture, Ecology, and Labor & Industries; WSU CAHNRS administrators, National Marine Fisheries Service, US Environmental Protection Agency, etc. (~50 people)
- Oregon/Idaho Simplot Onion Growers' Meeting, 15 Mar. 2016, Ontario, OR. One of four invited onion specialists, to discuss management of onion internal dry scale, bulb rots, thrips, and *Iris yellow spot virus* because of major losses to these problems in Treasure Valley onion bulb crops in the past several years. 4 hour discussion and presentations. (25 people)
- WSU Onion Cultivar Storage Demonstration Trial, Pasco, WA, 10 Feb. 2016. Assisted Extension colleagues and onion stakeholders with evaluating replicated plots of 50 onion cultivars for storage rots/quality, by completing storage rot ratings. Organized by Tim Waters & Carrie Wohleb, WSU Extension Educators. (25 people)
- Management of damping-off in organic vegetable crops. Invited by ConAgra/Lamb Weston to discuss management of damping-off in organic processing vegetable crops, particularly organic pea crops. Co-led 2.5 hour discussion with L. Porter, USDA ARS plant pathologist, 10 Feb. 2016, Kennewick, WA. (20 people)
- 7th Annual Spinach Fusarium Wilt Soil Bioassay Open House, 18-19 Feb. 2016, WSU Mount Vernon NWREC. Open house for spinach seed growers and seed company personnel to observe spinach parent lines ranging from highly susceptible to partially resistant fare in a bioassay test of soil sampled from growers' fields to assess the relative risk of Fusarium wilt. Soil samples (5 gal/field) were received from 31 fields in Dec. 2015 (\$200/field). Stakeholders viewed their soils to make decisions on which fields to select for planting spinach seed crops in 2016. >240 fields in WA have been tested since 2010.
- Invited to give a 4-hour workshop to onion growers for J.C. Watson Packing Co. Presentation and discussion internal dry scale, *Fusarium proliferatum*, other bulb rots, and general onion disease management. 14 Jan. 2015, Parma, ID. (25 people)
- American Seed Trade Association Vegetable Technical Subcommittee Meetings. Gave updates on WSDA Crucifer Quarantine and black leg, white leaf spot, and light leaf spot situation in the Pacific Northwest; WSDA Allium White Rot Quarantine; and spinach *Phomopsis* project. 6 Jan., 12 Apr., & 8 Jun. 2016 (via conference call, 25 people); prepared presentation on these topics for ASTA Vegetable & Flower Conference, Monterey, CA given in my absence by Philip Brown, Sakata America, 2 Feb. 2016. (75 people)
- WSU Organic Agriculture Seed Treatment Needs Assessment conference call. Organized 1.5 hour conference call for organic agriculture stakeholders to discuss seed treatment needs in organic agriculture in Washington State, 5 Jan. 2016. (15 people)
- Gave tours of WSU Mount Vernon NWREC and/or vegetable seed crops in Washington, and discussed vegetable seed production and seed pathology with various public and private groups including: ~50 Mount Vernon High School students (14 Apr.); Edmonds Community College (12 horticulture students,

28 Apr.); Bejo Zaden (4 people, 16 May); Seattle Garden Club (~25 people, 12 May); Skagitians to Preserve Farmland 5th grade student agricultural tour (92 5th graders, 13 May); Bejo Zaden (3 people from Netherlands, 16 May); Evergreen State College (35 students, 26 May); Mary Zitschke, Chair of California Leafy Greens Research Board (27 Jun.); Juliana Osorio-Marin, Spinach Breeder, Univ. of California-Davis (18 Jul.); Birte Boelt, Seed Crop Specialist, Aarhus University, Denmark (26 Sep.), Washington Sheep Producers' Assoc. (30 people, 28 Oct.).

2015 (19) Why Plant Science? Presentation in ENV5 201 Northwest Plants course for Dr. Brian Compton at Northwest Indian College, Bellingham, WA, 3 Dec. 2015. Co-presented with Dr. Shelley Presley, WSU Director of Undergraduate Research. Also toured NWIC campus, and had lunch with students to discuss career opportunities in STEM fields of study, as part of National Science Foundation Alliances for Graduate Education and the Professoriate (NSF AGEP) grant titled Pacific Northwest Collaborative Opportunities for Success in Mentoring of Students (PNW-COSMOS).

Vegetable Crops Management 101. Co-organized with T. Waters and members of PNW Vegetable Extension Group. 4-hour workshop on 17 Nov. 2015 in Kennewick, WA prior to Pacific Northwest Vegetable Association (PNVA) Annual Convention & Trade Show. Workshop requested by PNVA Board of Advisors. Training on vegetable diagnosis, insect/pest management, weed management, fertility, and irrigation with 8 speakers. Presentations translated simultaneously into Spanish, with Spanish and English copies of handouts/presentations. (68 registrants)
http://mtvernon.wsu.edu/path_team/VegCropResources.htm#wksp101

Diagnosing Plant Problems. Mentored MS student, Shannon Carmody, on developing a 4-hour plant diagnosis workshop (slides, handouts, and samples) for the Growing Veterans program and beginning Latino farmers in Skagit Valley, WA on 7 Nov. 2015 in collaboration with VIVA Farms. (25 people)

Organic Seed Alliance Research Field Day, 14 Oct. 2015, Chimacum, WA. Discussion on black leg of crucifers, risk management, and pending WSDA quarantine regulation. (25 people)

WSU Extension Onion Field Day, 27 Aug. 2015, Grigg & Sons farm, Quincy, WA. Presented onion disease information and research updates on bulb rots, internal dry scale, and mycorrhizae to growers, seed industry, extension personnel, researchers, etc. (100 people).

Washington Pest Control Tour of the Washington State Commission on Pesticide Registration, western WA, 27-29 Jul. 2015. Presented on vegetable seed production and research needs, including pathology research, to ~60 federal/state legislators or staff, agricultural industry representatives, WA State Depts. of Agriculture, Ecology, and Labor & Industries; WSU CAHNRS administrators, National Marine Fisheries Service, US Environmental Protection Agency, etc.

Managing Potential Diseases in Seed Crops. Invited 90 minute webinar for Bauta Family Initiative on Canadian Seed Security as part of a webinar series 'Seed Systems: Broadening Knowledge', 22 Jul. 2015. (50 people + later observers of recording) <http://www.seedsecurity.ca/en/117-webinar-series>

Organized a hands-on lab/greenhouse workshop on diagnosis, pathogenicity testing, and other aspects of the brassica black leg pathogen, *Phoma lingam*, for Jim Davis and Megan Wingerson, University of Idaho, in response to a widespread outbreak of black in canola crops in west-central Idaho in spring 2015. 15 Jul. 2015, Mount Vernon, WA. Co-organized with M. Derie, Scientific Assistant.

WSU Mount Vernon NWREC Field Day. Presented updates on brassica, beet, and spinach seed crop disease research and extension activities to ~75 growers, extension personnel, consultants, and other ag stakeholders in northwestern Washington as part of a 3-hour tour of NWREC field trials, 9 Jul. 2015, Mount Vernon, WA.

Carrot seed crop disease research discussion. Invited by Bejo Seed. Co. to meet with carrot seed production team from France, Netherlands, New Zealand, and USA, 8 Jul. 2015, Madras, OR.

'Talking About Plants' interview for KMRE 102.3 radio station (aired in May 2015).

Diagnosing Diseases in the Field. Presented a 45-minute webinar for Oregon State University Integrated Pest Management Workshop series coordinated by S. Rondon and S. Reitz, and funded by Western Sustainable Agriculture Research & Education. May 2015.
https://media.oregonstate.edu/media/t/0_7kh2o95w

Chaired organization of the WSU Organic Agriculture Stakeholder Forum held on 24 Apr. 2015 in North Bend, WA. The forum was attended by 48 invited organic stakeholders from across Washington State that represent the spectrum of organic agriculture, as well as WSU faculty and administrators, to examine how WSU can invest more strategically in organic agricultural research in Washington State, which is valued at ~\$350 million/year. Invited by Dr. Jim Moyer, Director of the WSU Agricultural Research

- Center, to organize this forum and chair the WSU Organic Agriculture Research Advisory Committee.
- Brassica clubroot needs assessment. 9 Mar. 2015, Everson, WA. Met with growers from smaller-scale, diversified farms in Whatcom Co. to discuss clubroot impact, management practices, and research needs; and to initiate planning for a Farmer-Researcher SARE grant application. (10 people)
- Columbia Basin Onion Growers' Meeting. T. Waters (lead), C. Wohleb, and L.J. du Toit organized a meeting with onion growers in the Columbia Basin to discuss forming an onion research committee to enhance onion research in the region. 2 Mar. 2015, Othello, WA. Results of a grower survey was then used to design a research committee protocol in collaboration with Ag Management Services.
- 6th Annual Spinach Fusarium Wilt Soil Bioassay, 19 Feb. 2015. Open house for spinach seed growers and seed companies to observe how spinach parent lines ranging from highly susceptible to partially resistant fare in a bioassay to test soil sampled from growers' fields for relative risk of Fusarium wilt. Soil samples (5 gal/field) were submitted from 29 fields in Dec. 2014 for the bioassay (\$200/field). Growers and seed company reps viewed results at the Open House to make decisions on which fields to select for planting spinach seed crops in 2015. This was the 6th winter the bioassay has been offered, with >200 fields in northwestern WA tested since 2010 to quantify Fusarium wilt risk.
- Seed Biology, Production and Quality Course, organized by the Seed Biotechnology Center, Department of Plant Sciences, University of California – Davis (UC-Davis), 10-12 Feb. 2015, Davis, CA. One of 6 invited instructors for a 3 day workshop for people in the seed industry (58 attendees). Presentations: 'Overview of seed pathology testing' with hands-on demonstrations of fungal and bacterial seed health testing methods (co-organized with Dr. Bob Gilbertson, UC-Davis, 10 & 11 Feb.); 'Seed phytosanitation in production and distribution' (10 Feb.); and 'Seed health testing' (12 Feb.).
- WSU Onion Cultivar Storage Demonstration Trial, Carr Farms, Pasco, WA, 9 Feb. 2015. Assisted Extension colleagues and onion stakeholders with evaluation of replicated plots of 55 onion cultivars for storage rots/quality. Responsible for storage rot ratings. Organized by Tim Waters & Carrie Wohleb, WSU Extension Educators.
- American Seed Trade Association – Vegetable Technical Sub-Committee Meetings: Gave updates on status of USDA APHIS PPQ spinach *Phomopsis* quarantine and research; black leg, light leaf spot, and white leaf spot in brassicas in the Pacific Northwest; and WSDA Allium white rot quarantine and disease outbreak. Discussion at meetings on 7 Jan. and 10 Jun. 2015 via conference call. (15 people)
- Gave tours of WSU Mount Vernon NWREC and/or vegetable seed crops in Washington, and discussed vegetable seed production and seed pathology with various public and private groups including: WSU Dept. of Crops & Soil Sciences and Dept. of Horticulture Graduate Student Statewide Tour (19 May); David Cross, Germaines Seed Technology, CA (30 Jun.); Chris Burrows, Townsend Seeds, New Zealand (30 Jun.); Evergreen State College students (14 Jul.); Merete Halkjaer Olesen, plant pathologist from Aarhus University, Denmark (20-23 Jul.); Ger Beemsterboer, former owner of Bejo Zaden, Holland (20 Jul.); 2-hour tour for 35 students from Seattle Goodwill youth program (7 Aug.); and other groups.
- 2014 (17) 2014 WSU Onion Field Day, Carr Farms, Pasco, WA, 28 Aug. 2014. Presented update on research projects on *Rhizoctonia* induced stunting in onion bulb crops, and mycorrhizae in onion crops. Field day attended by ~100 state/federal regulators, industry representatives, breeders, growers, consultants, researchers, & extension educators.
- 2014 WSU Extension Carrot Field Day, 15 Aug. 2014, Pasco, WA. Presented carrot disease management summary to growers, seed industry, and other carrot stakeholders (~30 people).
- 2014 Washington Pest Control Tour of the Washington State Commission on Pesticide Registration, central WA, 28-31 July 2014. Presented on vegetable seed production and research needs, including pathology research, to ~60 federal/state legislators or staff, agricultural industry representatives, WA State Depts. of Agriculture, Ecology, and Labor & Industries; WSU CAHNRS administrators, National Marine Fisheries Service, US Environmental Protection Agency, etc.
- Discussed seed crop disease research with Bjarne Hansen, Seed Production Manager for Vikima Seeds, Denmark, 11 Jul. 2013, Mount Vernon, WA.
- WSU Mount Vernon NWREC Field Day. Presented updates on spinach and table beet seed crop disease research trials to ~100 growers, consultants, extension educators, researchers, WSDA and seed industry personnel along with reports from other faculty at the NWREC, and 2 MS students in my program. 11 Jul. 2014, Mount Vernon, WA.
- WSU Vegetable Seed Field Day. Presented updates on brassica, beet, and spinach seed crop disease research and extension activities to ~40 vegetable seed growers, seed company production personnel, and research

- and extension faculty. 3-hour tour of field trials, 20 Jun. 2014, Skagit Valley, WA.
- Invited to participate in an emergency meeting titled 'Plant Disease Alert Meeting: Black Leg & Leaf Spots in Brassica, Mustard, & Radish Crops' following a widespread epidemic of black leg and two new leaf spot diseases, white leaf spot and light leaf spot, in diverse brassica crops in the Willamette Valley in spring 2014. Spoke on black leg fungicide seed treatment research by my program and the WSDA Crucifer Quarantine rules. Other speakers were from Oregon Dept. of Agriculture and Oregon State University plant pathologists. Presentations and panel discussion with diverse brassica stakeholders, including proposed ODA rules to reduce the risk of further spread and introduction of these diseases. 18 Jun. 2014, Albany, OR. Also visited infected brassica crops in the Willamette Valley on 18-19 Jun. 2014.
- Met with Western WA Small-Seed Advisory Committee (2 June 2014) and Columbia Basin Vegetable Seed Field Representatives Association (3 June 2014) to discuss: 1) the widespread epidemic of black leg of brassicas (caused by *Phoma lingam*) in the Willamette Valley of OR in spring 2014, a quarantine disease in northwestern WA; and 2) finding white rot in an onion seed crop (caused by *Sclerotium cepivorum*) in Grant Co. in May 2014, part of a 4-county quarantine area of WA for this disease. Presented information to growers and seed company field reps on these diseases, including management practices for reducing the risk of spread and establishment. With C. Ocamb at OSU, prepared a 2-page 'Alert' on black leg for widespread distribution among all brassica growers, seed dealers, seed companies, etc. in the Pacific Northwest to reduce the risk of further spread of the pathogen.
- Organized and led multiple group discussions and research/extension planning on beet seed crop production in western WA in response to declining seed yields and quality over several years: 3.5 hour meeting on 31 Jan. (30 people), 1 hour meeting on 23 Apr. (40 people), 8 Jul. (invited Prof. Irwin Goldman, table beet breeder and Chair of Dept. of Horticulture, University of Wisconsin, to meet with beet seed growers and industry personnel, and tour beet seed crops and beds to review production practices; 25 people).
- Invited to lead a 3-hour discussion on disease and insect management in onion seed crops for the seed production team of JW Seeds, 13 Mar. 2014, Oudtshoorn, South Africa.
- Invited to participate in a 4-hour workshop on disease and insect management in onion seed crops with the onion seed production team of Klein Karoo Seed Production, 12 Mar. 2014, Oudtshoorn, South Africa. Co-led the discussion with B. Wessels, consultant, ProCrop Trust.
- Invited to lead a discussion on management of soilborne diseases of vegetables with the production team for a large, commercial, mixed vegetable farm, Laastedrif, in the Ceres region, Western Cape Province, South Africa, 11 Mar. 2014, Ceres, South Africa.
- WSU Onion Cultivar Storage Demonstration Trial, Hartley Farms, Benton City, WA, 6 Feb. 2014. Assisted Extension colleagues and onion stakeholders with evaluation of replicated plots of 56 onion cultivars for storage rots/quality. Responsible for storage rot ratings. Organized by Tim Waters & Carrie Wohleb, WSU Extension Educators.
- Sustainability of Organic Spinach. Invited to provide seed pathology expertise for a discussion with spinach growers, crop consultants, and spinach seed industry representatives (~65 people) on disease management in organic baby leaf spinach production in Yuma, AZ and Salinas, CA following extensive losses to damping-off, downy mildew, and leaf spots. Visited spinach crops and participated in 2-hour discussion. 8 Jan. 2014, Pivot Point Conference Center, Yuma, AZ. Sponsored by Gowan Co., Yuma, AZ; Bornt Family Farms, Holtville, CA; and United Vegetable Growers Cooperative, Salinas, CA.
- Gave tours of WSU Mount Vernon NWREC and/or vegetable seed crops in northwestern Washington or central Washington, and discussed vegetable seed production and vegetable seed pathology issues to various public and private groups including: WSU CAHNRS deans, directors, and department chairs (20 Oct.); Ger Beemsterboer, owner of Bejo Zaden, Holland (25 Jul.); Habe Roode, HygroTech Seed Co., South Africa (6 Aug.); 5 Gates Foundation employees (5 Nov.); and various other groups.
- 2013 (12) 2013 Syngenta Global Root Health Forum, Beijing, China, 1-4 Sep. 2013. Invited to participate in a workshop on root health with an international group of scientists. Presented 2 posters on Verticillium wilt and Fusarium wilt of spinach.
- WSU Onion Field Day, Hartley Farms, Benton City, WA, 29 Aug. 2013. Presented update on research projects on *Rhizoctonia* stunting in onion bulb crops, mycorrhizae in onion crops, and development of a DNA macroarray for onion bacterial bulb rot pathogens. Field day attended by ~100 state/federal regulators, industry representatives, breeders, growers, consultants, researchers, & extension educators.
- WSU Mount Vernon NWREC Field Day, 11 Jul. 2013, Mount Vernon, WA. Presented research trials on diseases of vegetable/seed crops to growers, consultants, extension educators, researchers, WSDA and

- seed industry personnel along with reports from other faculty at the NWREC and two graduate students in my program.
- Seed Biology, Production and Quality Course, organized by the Seed Biotechnology Center, Department of Plant Sciences, University of California – Davis (UC-Davis), 12-14 February 2013, Davis, CA. One of 6 invited instructors for a 3 day workshop offered to people in the seed industry (60 attendees). Presentations: ‘Overview of seed pathology testing’ with hands-on demonstrations of fungal and bacterial seed health testing methods (co-organized with Dr. Bob Gilbertson, UC-Davis, 12 & 13 February); ‘Seed phytosanitation in production and distribution’ (13 February); and ‘Disease control in seed production’ (14 February); also gave a seminar during the Seed Central – Science session, 14 February, titled ‘Managing seed borne diseases: Lessons learned from *Verticillium* and spinach seed’.
- WSU Onion Cultivar Storage Demonstration Trial, L&L Farms, Othello, WA, 8 Feb. 2013. Assisted Extension colleagues and onion stakeholders with evaluation of 55 onion cultivars for storage rots/quality. Responsible for the storage rot ratings. Organized by Tim Waters & Carrie Wohleb, WSU Extension Educators.
- Gave tours of WSU Mount Vernon NWREC and/or vegetable seed crops in northwestern Washington or central Washington, and discussed vegetable seed production and vegetable seed pathology issues to various public and private groups including: Anna Dutton and David Belles, Syngenta Crop Protection (16 May); training on disease diagnosis in brassica seed crops for two WSDA seed crop inspectors for phytosanitary certifications (21 May); Joseph Stern and Shinki Iioka, Tokita Seed Co. (31 May); three French carrot seed growers and two administrators from the Federation Nationale des Agriculteurs Multiplicateurs de Semences (French seed growers association) (26 Jun.); WA State Pest Control Tour for ~75 legislators, regulators, consultants, dealers, researchers, etc. (30 Jul.); Rich Pollard (Bejo Seeds) and Jo Townshend (Midlands Seeds, New Zealand) (19 Aug.); tour and discussion with Jonah Mutsei, Farm Manager at the Gashora Girls School of Science and Technology in Rwanda, as part of the WSU Office of International Programs mentoring/training program (12 Sep.); accommodated Stuart Grigg, independent agronomist from Victoria, Australia, on an international travel fellowship to research spinach disease management (16 Sep.); Washington State legislative House of Representatives Agriculture & Natural Resources Committee tour of NWREC (2 Oct.).
- 2012 (20) Seed Safari, 9-10 Oct. 2012, Klein Karoo, South Africa. Invited guest speaker for a day-long tour of onion seed crops/farms in the Klein Karoo, South Africa, to examine diseases and discuss disease management, followed by a presentation and panel discussion. Organized by Klein Karoo Seed Production. Attended by 85 onion seed growers, consultants, and seed production managers in South Africa. <http://www.agrieden.co.za/gallery.php?Gallery=119> and <http://www.agrieden.co.za/news.php?id=533>
- WSU Onion Field Day, L&L Farms, Connell, WA, 30 Aug. 2012. Presented update on research projects on *Rhizoctonia* stunting in onion bulb crops, and development of a DNA macroarray for onion bulb rot pathogens. Field day attended by state/federal regulators, industry representatives, breeders, growers, consultants, researchers, & extension educators.
- WA State Commission on Pesticide Registration Pest Control Tour, 25 July 2012. Presentation on vegetable seed production and research needs, including pathology research, to ~50 federal/state legislators or staff, agricultural company representatives, WA State Depts. of Agriculture, and Labor and Industries, WSU CAHNRS administrators, National Marine Fisheries Service members, as part of a 3-day agricultural tour of central/eastern WA.
- WSU Mount Vernon NWREC Field Day, 12 Jul. 2012, Mount Vernon, WA. Presented report on research trials on diseases of vegetable/seed crops to growers, consultants, extension educators, researchers, WSDA and seed industry personnel along with reports from other faculty at the NWREC; three graduate students and an intern participated in my program’s component of the field day.
- ADVANCE in EXCELinSE workshop on professional development opportunities at WSU, 28 Mar. 2012, Pullman, WA. Organized and contributed as a speaker/participant with L. Carris, D.A. Inglis, and B.K. Schroeder. Attended by WSU graduate students, faculty, and USDA ARS scientists. Videotape of workshop: <http://advance.wsu.edu/default.asp?PageID=4461>
- Gave tours of WSU Mount Vernon NWREC and discussed vegetable seed production and vegetable seed pathology issues to various public and private groups including: Dr. Gerbert Hiddink and Debby Beugelskijk, seed pathologists, Enza Zaden, Netherlands (20 Feb. 2012); Masahiro Fukuta, carrot breeder, Sumika Agro-Tech, Japan (26 Mar. 2012); ARCS Foundation members, Seattle, WA (9 Apr. 2012); Dr. Scott McArt, entomologist, Cornell University (20 Apr. 2012); Ronald Kramer, Global

Production Manager, Nunhems Seed Co., Netherlands (24 Apr. 2012); ~50 students from Botany & Genetics course, The Evergreen State College, Olympia, WA (24 May 2012); Drs. Simon Anstis and Trevor Wicks, plant pathologists from South Australian Research & Development Institute, cooperating on an onion research project (29 May 2012); 10 board members of American Seed Trade Association Vegetable Technical Subcommittee (6 Jun. 2012); Drs. Donna Henderson & Sam Thomas, Monsanto Vegetable Seeds, Woodland, CA (7 Jun. 2012); Michael Piil, Managing Director, Vikima Seeds, Denmark (21 Jun. 2012); six visiting scientists from Azerbaijan (29 Jun. 2012); Chris Burrows, Director, and Lynn Townsend, Managing Director, Townsed Seeds, as well as Brent Clark, South Island Seed Conditioning, New Zealand (2 Jul. 2012); Vincent Kappelhof (Denmark), Chris Miller (California), and Paul Klein (Washington) from Rijk Zwaan Seed Co. (11 Jul. 2012).

WSU Onion Cultivar Storage Demonstration Trial, Pasco, WA, 10 Feb. 2012. Assisted Extension colleagues and onion stakeholders with evaluation of ~50 onion cultivars for storage rots/quality. Organized by Tim Waters & Carrie Wohleb, WSU Extension Educators.

With S. Jones, gave a tour of WSU Mount Vernon NWREC and presentation on vegetable seed production and vegetable seed pathology to ~150 people on 19 Jan. 2012, part of a day-long tour for 6th Organic Seed Growers' Conference, 19-22 Jan. 2012, Pt. Townsend, WA.

2011 (22) Invited to tour onion seed crops (9-13 Dec. 2011) in Klein Karoo, and onion bulb crops (13-15 Dec. 2011) in Ceres and Kouebokkeveld areas of South Africa to follow up on sabbatical projects on disease management. Presented 2 hour workshop on disease management in onion bulb crops, Kouebokkeveld, 15 Dec. 2011 attended by 35 onion farmers, production managers, and consultants.

Oregon State University Carrot Seed Field Day, Madras, OR, 1 Sep. 2011. History and current research on management of *Xanthomonas hortorum* pv. *carotae* in carrot seed crops. Field day attended by seed company field production managers, consultants, and researchers.

WSU Onion Field Day, Skone & Connors, Soap Lake, WA, 26 Aug. 2011. Presented update on research projects on *Rhizoctonia* stunting in onion bulb crops. Field day attended by state/federal regulators, industry representatives, breeders, growers, consultants, researchers, & extension educators.

WSU Mount Vernon NWREC Field Day, 14 Jul. 2011, Mount Vernon, WA. Presented report on field, greenhouse, and lab trials on diseases of vegetable/seed crops to growers, consultants, extension educators, researchers, WSDA and seed industry personnel for research & extension programs at NWREC; together with two graduate students.

Gave 4 tours of WSU Mount Vernon NWREC and presentations on vegetable seed production and vegetable seed pathology to public and private groups including: Sakata Worldwide QA and Production Pathology Team (25 people from USA, Brazil, Chile, France, Japan); and other visiting scientists, seed personnel, growers, and consultants from Denmark, France, Holland, Japan, South Africa, USA.

Accommodated visits and organized tours of vegetable and vegetable seed crops in Washington State for visiting scientists/growers: Drs. T. Wicks and S. Anstis, South Australian Research and Development Institute (SARDI), to discuss research on *Rhizoctonia* in onion crops (visited 23-27 May 2011); B. Wessels, vegetable and fruit crop consultant from Ceres, South Africa (visited 13-24 Jun. 2011); Drs. R. Mau and R. Shimabuku, University of Hawaii entomologist and extension agent (visited 11 Jul. 2011); D. Human, onion and carrot seed grower from DeRust, South Africa (visited 17-19 Jul. 2011); B. Featonby-Smith and N. van Rensburg, managers at Starke Ayres seed company, South Africa (visited 16 Aug. 2011).

Invited to speak with onion production managers at various farms in Ceres Valley and Kouebokkeveld Valley, Western Cape, South Africa on disease management in onion bulb crops, during sabbatical in South Africa (18-19 Jan., 25 Feb., 14-16 Mar., and 4-5 Apr. 2011).

Invited to speak with Seed Forum, vegetable seed company association, on observations and management recommendations for diseases had observed in vegetable seed crops in South Africa during my sabbatical, 20 Apr. 2011, Oudtshoorn, South Africa.

Invited to speak on disease management in vegetable seed crops and participate at an all-day workshop with Starke Ayres Pty Ltd (see company) seed production team, 15 Apr. 2011, Johannesburg, South Africa.

Lead an 8-hour workshop on disease management in small-seeded vegetable seed crops with seed crop production team, Klein Karoo Seeds (10 people), 4 Mar. 2011, Oudtshoorn, South Africa.

Toured Wildeklaar Farms (~2,000 ha vegetable operation) and participated in a workshop with farm management staff, Dr. R. Sikora, nematologist (University of Bonn, Germany), and Dr. A. Viljoen, plant

- pathologist (Chair, Dept. of Plant Pathology, University of Stellenbosch, South Africa), on disease management in vegetables, 9 Feb. 2011, Kimberly, South Africa.
- Toured crops and lead discussions on onion disease management, and held a workshop on basic statistics for on-farm research, ZZ2 (2,000 ha tomato, onion, and avocado farm, 27-28 Jan. and 1-2 Mar. 2011, Mooketsi, South Africa.
- 2010 (10) Toured >20 onion seed crops and carrot seed crops in the Western Cape, Northern Cape, and Eastern Cape Provinces of South Africa, 11-15 Dec. 2010. Consulted with seed growers and seed company personnel on disease diagnosis and management recommendations. Prepared a written report for Klein Karoo Seed Production.
- Toured onion bulb crops in Ceres Valley and Kouebokkeveld, Western Cape, South Africa, 29 Nov. – 3 Dec. 2010. Consulted with onion growers and crop consultants on disease diagnosis and management. Held 2 hour discussion with KORKOM, onion and potato growers' association, to summarize observations and provide management recommendations.
- WSU Onion Field Day, Weyns Farm, 2 Sep. 2010. Presented update on research projects on *Rhizoctonia* stunting in onion bulb crops and bacterial storage rot, and opportunities for grower participation in a multi-state USDA Specialty Crop Research Institute onion grant initiated in Oct. 2010. Field day attended by state/federal regulators, industry representatives, breeders, growers, consultants, researchers, & extension educators.
- 34th International Carrot Conference, Kennewick, WA, 26-28 Jul. 2010. Chaired the organizing committee. Attended by ~100 people from 13 countries for 1.5 days of presentations and a field tour.
<http://www.pnva.org/carrotconf/>
- WSU Mount Vernon NWREC Field Day, 8 Jul. 2010, Mount Vernon, WA. Presented report on field, greenhouse, and lab trials on diseases of vegetable/seed crops to growers, consultants, extension educators, researchers, WSDA and seed industry personnel for research & extension programs at NWREC; together with two graduate students and an undergraduate intern from WSU.
- 2010 Spinach *Verticillium* Seed Assay Workshop. 6 hour, hands-on, lab workshop to demonstrate identification and differentiation of *Verticillium* spp. and other necrotrophic fungi on spinach seed. 31 Mar. 2010, University of California-Davis, Davis, CA. Co-organized with S.T. Koike, University of California Cooperative Extension. Attended by 28 plant/seed pathologists (4 from the EU) from seed companies, private and state seed testing labs, consulting companies, and regulatory agencies.
- Development of an internationally accepted, standardized assay for *Verticillium* in spinach seed: Provided research results and helped lead a 3 hour discussion (31 Mar. 2010, University of CA-Davis) with 23 members of International Seed Health Initiative – Vegetable Technical Group. Organized an international ring test in 2010 for a standardized spinach *Verticillium* seed assay, with 9 participating labs in US and EU.
- 34th Soil Fungus Conference, 22-24 Mar. 2010, WSU Mount Vernon NWREC, Mount Vernon, WA. ~75 participants from western US. Served as local arrangements person to coordinate facilities, catering, reception, sponsorships, and field tour. <http://soilfungus.ars.usda.gov/index.htm>
- Interview with reporter, John Ryan, for article on brassica biofuel crops and vegetable brassica seed crops titled 'Skagit Farmers Wary Of Biofuel Crops' which aired on KUOW National Public Radio on 6 Jan. 2010: <http://kuow.org/program.php?id=19137>. Article also in CheckBiotech, 7 Jan. 2010: http://bioenergy.checkbiotech.org/news/skagit_farmers_wary_biofuel_crops.
- Gave >12 tours of WSU Mount Vernon NWREC and presentations on vegetable seed production and vegetable seed pathology to various public and private groups including Board of Directors from 5 countries for Vikima Seeds; 35 seed pathologists from >10 countries attending the International Seed Health Initiative Vegetable Technical Group conference (5 Aug. 2010); and other visiting scientists and seed industry personnel from Denmark, France, Holland, India, Japan, Korea, UK, and across the USA.
- 2009 (8) Molecular Carrot Seed Health Assay Workshop, WSU Mount Vernon NWREC, Mount Vernon, WA, 16-17 Jun. 2009. Hands-on, 2 day, laboratory workshop to teach 13 pathologists from seven of the main vegetable seed companies in the world (Alf Christianson Seed Co., USA; Bejo Zaden B.V., Netherlands; Clause Vegetable Seeds, France; Nunhems USA, Inc., USA; Sakata Seed America, USA; Seminis Vegetable Seeds, USA; Vilmorin SA, France) how to use a DNA-binding dye to differentiate DNA from live vs. dead cells of the carrot bacterial blight pathogen, *Xanthomonas hortorum* pv. *carotae*, in seed assays with each of two quantitative DNA assays (real-time PCR and loop mediated isothermal

- amplification = LAMP). The methods were developed using funding from the California Fresh Carrot Advisory Board and participating seed companies.
- WSU Onion Cultivar Storage Demonstration Trial, Pasco, WA, 10 Feb. 2009. Assisted with evaluation of 50 onion cultivars for storage rots/quality. Organized by Tim Waters, WSU Franklin/Benton Counties Extension Educator.
- WSU Mount Vernon NWREC Field Day, 9 Jul. 2009, Mount Vernon, WA. Organized field day for research & extension programs at NWREC; together with two graduate students and an undergraduate intern from WSU, presented report on field, greenhouse, and lab trials on diseases of vegetable/seed crops to growers, consultants, extension educators, researchers, WSDA and seed industry personnel.
- Washington Pest Control Tour, Skagit Co., WA, 27 Jul. 2009. Presented a tour of the WSU Mount Vernon NWREC and gave a field trial presentation on seed crop disease research to state/federal regulators (including from EPA, Dept. of Energy, Dept. of Health, Dept. of Labor & Industries, USDA, and WSDA), industry representatives, consultants, and researchers.
- WSU Onion Field Day, Grigg & Sons, Quincy, WA, 27 Aug. 2009. Presented update on research on onion seed treatments for damping-off and neck rot pathogens, and on *Rhizoctonia* causing patches in onion bulb crops. Field day attended by state/federal regulators, industry representatives, breeders, growers, consultants, researchers, & extension educators.
- Provided training at the NWREC on research methods for *Verticillium* in spinach seed and *Xanthomonas hortorum* pv. *carotae* on carrot to Matt May, Research Associate from Seminis Vegetable Seeds, Woodland, CA, 6-9 Apr. 2009; and on *Xanthomonas hortorum* pv. *carotae* on carrot to Dr. Bo-Ming Wu, Assistant Professor from the Dept. of Botany & Plant Pathology, Oregon State University Madras REC, 28-29 Apr. 2009.
- Gave tours of WSU Mount Vernon NWREC as well as presentations on vegetable seed production and vegetable seed pathology to 10 undergraduate students and 2 faculty from Brigham Young University Idaho campus (10 Jun. 2009); Anacortes Newcomers (18 Nov. 2009); and various public and private groups including visiting scientists and seed industry personnel from Denmark, France, Holland, India, Japan, Korea, and multiple states in the USA.
- 2008 (8) “Vegetable Diagnosis Workshop”, 18 Nov. 2008, Kennewick, WA. Organized and presented at a 4 hour workshop on vegetable diagnosis along with 7 other members of the Pacific Northwest Vegetable Extension Group (PNW VEG), using 12 vegetable ‘case studies’ for participatory demonstration of diagnostic principles.
- WSU Onion Field Day, Carr Farms, Pasco, WA, 28 Aug. 2008. Presented progress report on research trials on Enterobacter bulb rot and onion seed treatments for damping-off and neck rot pathogens to state/federal regulators, industry representatives, growers, consultants, & extension educators. Organized an onion bulb storage rot demonstration of fungal, bacterial, and yeast pathogens in collaboration with B.K. Schroeder (WSU phytobacteriologist).
- Washington Pest Control Tour, Columbia Basin, WA, 23 Jul. 2008. Field presentation on seed crop disease research to state/federal regulators, industry representatives, growers, consultants, & extension educators.
- WSU Mount Vernon NWREC Field Day, 10 Jul. 2008, Mount Vernon, WA. Organized field day for research & extension programs at NWREC; presented progress reports on field, greenhouse, & lab trials on diseases of vegetable seed crops in western WA, to growers, consultants, extension educators, WSDA & seed industry personnel.
- Gave tours of WSU Mount Vernon NWREC and presented information on significance of Pacific Northwest vegetable seed production and disease management to: Botany 102 students from Skagit Valley College, Mount Vernon, WA, 13 Mar. 2008; International Association of University Women, 11 Apr. 2008; AgriStar Brazilian beet growers, 30 Apr. 2008; and tours to >30 vegetable seed industry personnel from Denmark, Japan, Holland, New Zealand and various US states.
- Set up a display for WSU at the ‘Science Night’ at Mount Vernon High School to encourage youth involvement and recruitment into scientific careers, 15 May 2008. Coordinated with T.W. Walters and T.W. Miller.
- WSU Onion Cultivar Storage Demonstration Trial, Benton City, WA, Feb. 2008. Assisted with evaluation of 55 onion cultivars for storage rots/quality. Organized by Tim Waters, WSU Franklin/Benton Counties Extension Educator.
- Invited by Midlands Seeds (New Zealand) and Bejo Zaden B.V. (Netherlands) to review disease management in carrot and other vegetable seed crops in the Canterbury Plains, South Island, New Zealand. Reviewed

- disease management for carrot seed production. Toured with M.L. Derie (WSU), R. Simmons (Oregon State University), B. Martins (Central Oregon Seeds, Inc.), R. Pollard (Bejo Seeds USA), and L. van der Heijden (Bejo Zaden, Netherlands), 27 Jan. – 1 Feb. 2008.
- 2007 (7) WSU President Floyd and CAHNRS Dean Bernardo tour of WSU Mount Vernon NWREC, 28 Nov. 2007. Assisted with tour as well and participated in a meeting with regional agricultural stakeholders.
- U.S. State Department of Agriculture Directors tour of Skagit County & WSU Mount Vernon NWREC, 22 Sep. 2007. Assisted with bus tour of farmland in the Skagit Valley, & presentation on vegetable seed pathology research/extension program.
- WSU Onion Field Day, Hartley Farms, Prosser, WA, 23 Aug. 2007. Presented progress report on research trials on *Iris yellow spot virus* and Botrytis neck rot of onion to state/federal regulators, industry representatives, growers, consultants, & extension educators.
- WSU Mount Vernon NWREC Field Day, Mount Vernon, WA 10 Jul. 2007. Presented progress report on field, greenhouse, and lab trials on diseases of vegetable seed crops in western WA, to growers, consultants, extension educators, WSDA & seed industry personnel.
- Tour of Pacific Northwest vegetable seed production areas to researchers, seed company personnel, and seed growers from New Zealand, 4-6 & 25-27 Jun., & 16-17 Jul. 2007, Skagit Valley, Columbia Basin, & central OR.
- WSU Onion Cultivar Storage Demonstration Trial, Quincy, WA, 1 Feb. 2007. Co-organized with Tim Waters, WSU Franklin/Benton Counties Extension Educator.
- Everett High School horticulture student tour of WSU Mount Vernon NWREC, 13 Apr. 2007. Presentation on vegetable seed production, plant pathology, & seed pathology.
- 2006 (2) Washington Pest Control Tour, Columbia Basin, WA, 26 Jul. 2006. Field presentation on seed crop disease trials to state/federal regulators, industry representatives, growers, consultants, & extension educators.
- WSU Onion Cultivar Storage Demonstration Trial, Quincy, WA, 10 Feb. 2006. Co-organized with Mark Trent, WSU Grant/Adams Counties Extension Educator. <http://grant-adams.wsu.edu/agriculture/Vegetable%20Page/20005onion%20storage%20results.pdf>
- 2005 (7) WSU Vegetable Seed Field Day, 16 Jun. 2005, WSU-NWREC, Mount Vernon, WA. Demonstrated field trials & presented research reports on carrot, spinach, & brassica seed crop diseases. Co-organizer with T.W. Miller, WSU Weed Scientist.
- WSU Columbia Basin Onion Field Day, 26 Aug. 2005, L&L Farms, Connell, WA. Planted & managed 2005 onion cultivar trial. Co-organized field day with Mark Trent, WSU Extension Educator. Presented research report on *Iris yellow spot virus* in onion bulb & seed crops in Washington. <http://grant-adams.wsu.edu/agriculture/Vegetable%20Page/2005onion%20varietal%20results.pdf>
- Invited by Bejo Zaden B.V. to participate in the Brassica Open Days Research Symposium & Field Day in Akersloot, the Netherlands, 27-28 Sep. 2005.
- Legislative Tour of WSU-NWREC in Mount Vernon, WA on 12 Jul. 2005. Presented vegetable seed crop research trials to legislators and representatives from Olympia, WA.
- Washington Pest Control Tour, Skagit Co., WA, 19 Jul. 2005. Field presentations on seed crop disease trials to state/federal regulators, industry representatives, growers, consultants, & extension educators.
- Gave Everett High School horticulture students a tour of WSU-NWREC in Mount Vernon, WA on 16 Apr. 2005, including demonstration of lab & greenhouse seed pathology research trials.
- Gave 15 students from Evergreen State College a tour of the seed pathology program at WSU-NWREC, 28 Jun. 2005. Gave a lecture on seed production and seed pathology, toured lab, greenhouse, & field seed crop research trials at WSU-NWREC in Mount Vernon, WA.
- 2004 (5) Spinach Seed Assay Workshop, 2 Apr. 2004, Mount Vernon, WA. Organized & presented a 6-hour lab workshop for seed companies and commercial seed labs in the US, on a freeze-blotter assay to detect *Stemphylium botryosum*, *Cladosporium variabile*, and *Verticillium dahliae* on spinach seed.
- Spinach Seed Assay Workshop, 11 Jun. 2004, Naktuinbouw, Roelofarendsveen, The Netherlands. Organized & presented a lab workshop for seed companies and seed labs in the EU on a freeze-blotter assay to detect *Stemphylium botryosum*, *Cladosporium variabile*, and *Verticillium dahliae* on spinach seed.
- WSU Columbia Basin Onion Field Day, 27 Aug. 2004, near Quincy, WA. Presented research reports & demonstrated trials on gray mold/neck rot & *Iris yellow spot virus* of onion bulb & seed crops in WA.
- WSU Master Gardener ‘Garden Daze’. Assisted plant clinic session, 24 Jul. 2004, WSU-NWREC, WA.
- WSU Vegetable Seed Field Day, 13 Jul. 2004, WSU-NWREC, Mount Vernon, WA. Demonstrated field trials on diseases of spinach seed crops. Coordinated program with T.W. Miller & D.M. Havens.

- 2003 (6) Leafy Vegetable Disease Diagnosis Workshop: Chenopodiaceous and Cruciferous Vegetables in Northwestern WA. Sponsored by WSU Vegetable Pathology Team. 24 Jul. 2003, WSU-Mount Vernon, WA. Coordinated program & gave presentations with D.A. Inglis & J.R. Glass.
 Skagit County Government Tour. Presentation on the vegetable seed industry in western WA, 19 Aug. 2003.
 Washington Pest Control Tour, 14-15 Aug. 2003. Presentation on the small-seeded vegetable seed industry in western Washington, to regulators, industry reps, growers, consultants, extension agents, & educators.
 WSU Vegetable Seed Field Day, 8 Jul. 2003, Mount Vernon, WA. Demonstrated field trials on diseases of spinach seed crops & Brassica seed crops. Coordinated program with T.W. Miller & D.M. Havens.
 WSU Columbia Basin Onion Field Day, 28 Aug. 2003, near Quincy, WA. Presented research reports on gray mold/neck rot of onion bulb & seed crops in WA.
 WSU Master Gardener 'Garden Daze'. Assisted plant clinic session, 26 Jul. 2003, WSU-Mount Vernon, WA.
- 2002 (4) WSU Grass & Vegetable Seed Field Day, 26 Jun. 2002, WSU-Mount Vernon, WA. Demonstrated field trials on diseases of spinach & Brassica seed crops. Coordinated program with T.W. Miller & D.M. Havens.
 WSU Onion Field Day, 30 Aug. 2002, near Quincy, WA. Presented an update on field trials on gray mold/neck rot of onion bulb & seed crops in WA.
 WSU Vegetable Pathology Team tour of the Columbia Basin, 28-30 Aug. 2002. Coordinated with D.A. Inglis.
 USDA Foreign Agricultural Service, Emerging Market Program. Coordinated an agricultural tour of Skagit Valley on 18 Sep. 2002 for Chinese agricultural government officials, for Dr. Francis Tuan, Senior Economist & Leader of the China Project of the USDA Economic Research Service.
- 2001 (4) "Diagnosis of Vegetable Diseases" workshop. Coordinated workshop with S.T. Koike (University of California). Seven plant pathologists from 5 states presented information on diseases of vegetables., with hands-on demonstrations. Annual Meeting of APS, 25 Aug. 2001, Salt Lake City, UT.
 "Plant Diseases" workshop on disease diagnosis/management and internet resources for pest management. Coordinated with J. Kropf (WSU). Annual Meeting of the Western Washington Horticulture Association, 3 Jan. 2001, SeaTac, WA.
 Washington Pest Control Tour. Presentation on the small-seeded vegetable seed industry in western WA to state/federal regulators, industry representatives, growers, consultants, extension agents, & educators.
 WSU Grass & Vegetable Seed Field Day, 27 Jun. 2001, WSU-Mount Vernon, WA. Demonstrated field trials on diseases of spinach & Brassica seed crops. Coordinated with T.W. Miller & D.M. Havens.

MEMBERSHIP AND INVOLVEMENT IN PROFESSIONAL SOCIETIES/COMMITTEES

American Phytopathological Society (APS) (since 1991)

Vice President (2017-18), Incoming President (2018-19), President (2019-20), Past President (2020-21)

Councilor-at-Large (2014-2017)

Ad hoc Committee on the Documentation and Communication of the Impact of Plant Pathology (2014-15)

Ad Hoc Task Force on Journal Publication Strategies (2015-2017)

APS Foundation Board (Aug. 2013-Aug. 2014)

2012 APS Council Fellow: Invited participation in APS Leadership Institute, 3-4 Aug. 2012

Senior Editor: *Plant Disease* (2010-12, 2013-15)

Associate Editor: *Phytopathology* (2009-11), *Plant Disease* (2000-02)

Section Editor: Vol. 1, 2, & 3 of *Plant Disease Management Reports* (2006-09), & Vol. 61 of *Fungicide & Nematicide Tests* (2005-06)

Nominations Committee (2016-17)

Pacific Division: Local Arrangements Committee for annual meeting in La Conner, WA in June 2016; Awards Committee (2013); judged student papers (2009 meeting, Portland, OR); nominated for President-Elect, 2006 (not elected); chaired Discussion Session 2 - Vegetables & Row Crops (2012 meeting, Sacramento, CA).

Diagnostics Committee (2000-04; Chair 2002-03)

Seed Pathology Committee (since 2005; Chair 2007-09); organized seed symposium for national APS meetings in 2006 (Austin, TX) & 2007 (San Diego, CA), co-organized & moderated lab workshop at 2008 national meeting (Minneapolis, MN), organized and moderated APS-ISF symposium at 2009 national meeting (Portland, OR); organized Melhus Graduate Student Symposium, chaired screening committee for student applications for travel awards, and co-moderated the symposium at the 2010 national meeting (Charlotte, NC); organized PhytoViews Session on Seed Health for 2015 national meeting (Pasadena, CA).

Ad hoc committee on APS-International Seed Federation Collaboration (ISF), renamed in 2013 as the Committee on Plant Pathogen Strain Identification (2007-14); monthly conference calls with US and EU members to develop a standardized nomenclatural system for pathogen races/strains; organized and moderated APS-ISF symposium for 2009 national meeting (Portland, OR); APS-ISF website went 'live' in Nov. 2010 (http://www.worldseed.org/isf/strain_identification.html#1) with spinach downy mildew as the 1st disease for which the public can order seed of differential cultivars through USDA GRIN (<http://www.ars-grin.gov/cgi-bin/npgs/html/close.pl?279001+ISF3>) and cultures of reference strains of the pathogen (chaired development of this 1st disease template with EU and US stakeholders/researchers).

Widely Prevalent Fungi Working Group – Pacific Northwest coordinator (since June 2015)

California Seed Association (CSA) Spinach Downy Mildew Working Group, and CSA *Verticillium* Working Group:

Advisory member of west coast spinach academic and industry stakeholders (since Mar. 2010).

Columbia Basin Vegetable Seed Assoc. (CBVSA) & Field Reps. Assoc. (CBVFRA): Ex-officio member (since 2004)

Crop Science Society of America

Associate Editor for *Agronomy Journal* (Aug. 2008-Jul. 2011)

Gamma Sigma Delta Honor Society of Agriculture, Illinois Chapter (1993-94)

International Seed Health Initiative (of International Seed Federation) Pathogen Coding Working Group (since 2009)

International Society of Plant Pathology (ISPP) (since 1994)

Ornamentals Northwest (ONW) Seminars (1998-2000): Organizing committee, 1999 & 2000, Portland, OR

Plant Diagnostician's Quarterly, national newsletter for plant diagnosticians (1998-2000)

Submitted quarterly regional reports on samples diagnosed at WSU-Puyallup Plant & Insect Diagnostic Lab
Puget Sound Seed Growers' Association, and Western Washington Small Seed Advisory Committee: Ex-officio member of both (since 2001)

Southern African Society for Plant Pathology (SASPP) (since 1991)

Washington State Department of Agriculture

Seed Program Advisory Committee (since 2002), Crucifer Working Group (since 2004)

Western Vegetable Disease Conference (2000-03): Coordinator for annual meetings from 2001 to 2003, Portland, OR

Western Washington Horticulture Association: President (2002-03), Board of Directors (2000-04)

ADDITIONAL TRAINING & PROFESSIONAL DEVELOPMENT

- 2016 Attended 1-day **Vegetable Seed Health Workshop** on 4 Jun. 2016 during 2016 Assoc. Official Seed Analysts-Soc. Commercial Seed Technologists Annual Meeting, 4-6 Jun. 2016, Portland, OR. Paid for 2 graduate students and 1 technician in my program to attend the workshop as well.
- 2015 Attended a 4-day workshop on **Taxonomy of Bacterial Plant Pathogens** organized by Dr. Carolee Bull, USDA ARS phytobacteriologist, 26-29 May 2015, Salinas, CA. The workshop entailed lectures and discussions on classification, nomenclature, and identification of bacterial plant pathogens; and lab experience with DNA sequence analysis, including laboratory exercises in rep-PCR assays and multilocus sequence typing.
- 2012 Nominated by WSU CAHNRS Dean, Dan Bernardo, to participate in **WSU 2012 Provost's Leadership Development Academy** (Jan.-Dec. 2012) for junior and mid-term faculty to develop skills for effective leadership and become familiar with policies and procedures that govern operation of WSU. Selected as an **APS Council Fellow** to participate in the **2012 APS Leadership Institute** based on APS leadership roles I have had in APS, and future leadership. Attended workshops at the national APS meeting in Providence, RI: Leadership Institute I – Finding Your Style, 3 Aug. 2012; and Leadership Institute II – Working with Others, 4 Aug. 2012. Attended **Effective Performance Appraisal** webinar training by Kimberley Maupin, WSU Human Resources Manager, 5 September 2012. Attended WSU **Advancing International Research** workshop, 2 Oct. 2012. Completed WSU **Discrimination and Sexual Harassment Prevention** online training and certificate, 26 May 2012. Attended **Making the Leap to Professor** seminar by WSU Vice-Provost, Fran McSweeney, 28 Mar. 2012.
- 2011 Attended **WSU Pesticide Policy** webinar, 27 Sep. 2011. Attended **Mental Health First Aid** training, 20-21 Jul. 2011, through WSU Recreation and Wellbeing program. Attended **2011 Case Studies in Science Summer Workshop**, 16-20 May 2011, University at Buffalo, State University of New York, Buffalo, NY. 40 hours of training on the use of case studies in teaching science,

- organized by National Center for Case Study Teaching in Science. Attended workshop to prepare for teaching PLP 525 (Field Plant Pathology) in summer 2012.
- 2010-11 Approved for 6 months of **professional academic leave** (Nov. 2010 – Apr. 2011) to assist onion/seed growers in South Africa with disease management; and to learn molecular lab skills. Host: Dr. Adele McLeod, Dept. of Plant Pathology, **University of Stellenbosch, South Africa**.
Nominated by WSU CAHNRS Dean Bernardo to attend “**2011 Leadership Development Program**” for junior and mid-term WSU faculty to develop leadership skills. Declined invitation because of overlap with international professional leave (see above).
- 2010 WSU College of Agriculture & Natural Resource Sciences **Enhancing our Workplace by Improving our Life Skills workshop series**: I. What’s Your Type? Creating Effective Strategies for Communication with Diverse Personality Types (21 Sep.2010). III. Complaints to Commitment: Finding the Value and Challenge in our Everyday Complaints (22 Oct. 2010).
Attended WSU workshop **Teaching Without Borders: Expanding Distance Delivery Options for CAHNRS Courses**, 4 Mar. 2010, by videoconference.
Attended WSU training session **Making the Leap to Professor** by Prof. McSweeney, 24 Mar. 2010.
- 2008 **Novel Techniques for Seed Health Testing**, 2-day lab workshop on magnetic capture hybridization and multiplex real-time PCR assays for seedborne pathogens of cucurbits, supported by USDA CSREES Plant Biosecurity Program, held at Seed Science Center, Iowa State University, 12-14 May 2008, Ames, IA.
- 2007 **Real-Time PCR Workshop for Applied Plant Pathologists**, University of Kentucky, 23-25 Jan. 2007, Lexington, KY.
Fred Pryor Seminar **How to Communicate with Tact & Professionalism**, 9-10 Oct. 2007, Bellingham, WA.
Washington State Dept. of Personnel Workshop **Interpersonal Conflict Management**, 10-11 Dec. 2007, Olympia, WA.
- 2006-07 **Grant writing workshop** by Grant Writers’ Seminars & Workshops, LLC, Oct. 2006-Jun. 2007.
- 2005 Rockhurst University Continuing Education Center, Inc., National Seminars Group: 2-day seminar **Management & Leadership Skills for Supervisors & Managers**, 27-28 Oct. 2005, Bellevue, WA.
- Since 2000 **Washington State Dept. of Agriculture Pesticide License**: 1) Demonstration & Research Operator, 2) Public Operator, 3) Public Pest Control Consultant, 3) Seed Treatment.

TEACHING EXPERIENCE

- 2017 Soil-Plant-Microbial Interactions (Soils 541): Guest lecture on plant pathogen-root-nutrient dynamics, 26 Oct. 2017, Pullman, WA (xx students at x locations).
WSU Certified Crop Advisor Preparation graduate course (Soils 449): Guest lecture for Dr. Pan on integrated disease management, 20 Apr. 2017 videoconference to Pullman (12 students).
- 2016 WSU Field Plant Pathology graduate class (PIP 525, 3 credits), Jun.-Jul. 2016 (21 students).
Introduction to Cultivated Plants (WSU Crops/Hort. 102): Guest lecture for Dr. M. Pumphreys on vegetable seed production in Washington and seed pathology concepts, 4 Nov. 2016 to Pullman from Mount Vernon, WA via videoconference (182 students at WSU Pullman and WSU Vancouver).
- 2015 Soil-Plant-Microbial Interactions (Soils 541): Guest lecture for Drs. Pan and Sullivan on plant pathogen-root-nutrient dynamics, 8 Dec. 2015, Pullman, WA (17 students at 5 locations).
Introduction to Cultivated Plants (WSU Crops/Hort. 102): Guest lecture for Dr. M. Pumphreys on vegetable seed production in Washington and seed pathology concepts, 7 Dec. 2015, Pullman, WA (156 students at WSU Pullman and WSU Vancouver).
Seed Biology, Production and Quality Course, organized by the Seed Biotechnology Center, Department of Plant Sciences, Univ. of California – Davis, 10-12 Feb. 2015, Davis, CA (4 lectures/demonstration to 66 participants).
- 2014 WSU Field Plant Pathology graduate class (PIP 525, 3 credits), Jun.-Aug. 2014 (23 students).
- 2013 Introduction to Cultivated Plants (WSU Crops/Hort. 102): Guest lecture for Dr. M. Pumphreys on vegetable seed production in Washington and seed pathology concepts, 4 Nov. 2013, Pullman, WA (142 students).
Agricultural & Food Systems 445/545, Field Analysis of Sustainable Food: Guest lecture on seed production and seed pathology during student visit to WSU Mount Vernon NWREC, 11 Mar. 2013 (21 students).
Guest speaker for Seed Biology, Production & Quality Course, 12-14 Feb. 2013, Seed Biotechnology Center, University of California – Davis. 4 lectures/demonstrations on seed pathology (60 participants from seed industry).
- 2012 WSU Field Plant Pathology graduate class (PIP525, 2 credits), Jun.-Aug. 2012 (19 students).

- Introduction to Cultivated Plants (WSU Crops/Hort. 102): Guest lecture for Dr. M. Pumphreys on vegetable seed production in Washington and seed pathology concepts, 26 Nov. 2012, Pullman, WA (139 students).
 Agricultural & Food Systems 101 (WSU AFS 101, 59 students): Guest lecture for Dr. K. Kidwell on a controversial seed pathology topic. Prepared handouts and discussed ‘Verticillium infection of spinach seed: Regulatory and scientific controversy affecting seed trade’, 30 Oct. 2012, Pullman, WA.
- 2011 Agricultural & Food Systems 101 (WSU AFS 101, ~80 students): Guest lectur for Dr. K. Kidwell on a controversial plant pathology topic. Prepared handouts and lead discussion on ‘Verticillium infection of spinach seed: Regulatory and scientific controversy affecting seed trade’, 26 Oct. 2011, Pullman, WA.
 Guest lectures (two) for PLP 478, 4th year plant pathology course (7 students) titled ‘Disease management in vegetable seed crops’ (14 Feb. 2011) and ‘Starting an Extension specialist career from the ground up’ (18 Feb. 2011), Dept. of Plant Pathology, University of Stellenbosch, Stellenbosch, South Africa. Organized a 1-day field trip to vegetable farms in Ceres, South Africa for students in PLP 478 (17 Feb. 2011).
 Guest lecture titled ‘Infection of seed and transmission of seedborne pathogens’ to ~30 third year plant pathology students, 29 Mar. 2011, Dept. of Plant Pathology, University of Stellenbosch, Stellenbosch, South Africa.
- 2010 WSU Field Plant Pathology graduate class (PIP525, 3 credits): Co-taught with Gary Grove in summer 2010 (17 graduate students).
- 2009 Guest lecturer for Iowa State University’s distance education course in Seed Pathology, PLP 594. Hour-long presentation recorded in Feb. 2009.
- 2005 Guest lectur & coordinator of field trip for WSU “Viruses & Virus Diseases of Plants” class (PIP511), 23 Apr. 2005. Toured onion bulb/seed crops to learn about *Iris yellow spot virus*.
- 2001-04, 06, & 08 Guest lectur for WSU Field Plant Pathology class (PIP525); added a ½ day session on experimental design and organized tour of vegetable crops in Columbia Basin in 2008.
- 2002-03 Advanced Master Gardener training in plant disease diagnosis
- 1998-2000 Basic & Advanced Master Gardener training in introductory plant pathology, disease management, & plant problem diagnosis for 10 to 12 counties in western WA, WSU Cooperative Extension. 6-hour workshops for classes of 20 to 140 people.
- 1997 Teaching Assistant for Introductory Plant Pathology (Crop Sci. 204), UIUC
- 1996 Teaching Assistant for Design and Analysis of Biological Experiments (Crop Sci. 440), UIUC
- 1995 Teaching Assistant for Epidemiology of Plant Diseases (Pl. Pa. 408), UIUC
- 1994 Teaching Assistant for Introductory Statistics (Agron. 340), UIUC
- 1993 Teaching Assistant for Disease Diagnosis (Pl. Pa. 308), UIUC
- 1991 Laboratory Demonstrator for Plant Pathology 1, UNP
- 1990 Tutor for Biometry 1, UNP

STUDENTS & POSTDOCTORAL RESEARCH ASSOCIATES

Postdoctoral research associates (4)

- 2016 **Leonard Murithi Kiirika**, WSU Dept. of Plant Pathology. Project: Arbuscular mycorrhizal fungi onion and carrot production in the Columbia Basin. (WSDA Specialty Crop Block Grant). Feb.-Apr. 2016.
- 2012-14 **Dipak Sharma Poudyal**, WSU Dept. of Plant Pathology. Project: Management of *Rhizoctonia* in vegetable-cereal cropping systems in the Columbia Basin of Washington and Oregon. (WSDA Specialty Crop Block Grant). Co-advised with T. Paulitz, USDA ARS, Pullman, WA.
- 2010-12 **Cheryl Vahling**, WSU Dept. of Plant Pathology. Project: Development of a macroarray for fungal bulb rot pathogens of onion (USDA SCRI grant, USDA WRIPM grant).
- 2003-04 **Martin Chilvers, Postdoctoral Research Associate**, WSU Department of Plant Pathology. Development of a real-time PCR seed assay for *Botrytis* spp. associated with neck rot of onion.

PhD students

PhD committee chair (4)

- 2008-13 **Emily Gatch**, WSU Dept. of Plant Pathology. Dissertation: Management of Fusarium wilt in spinach seed crops in the maritime Pacific Northwest USA. With L. Carris, helped Gatch obtain a WSU Graduate School Student Scholar Award. Graduated Aug. 2013.
- 2009-13 **Ana Vida Alcalá**, WSU Dept. of Plant Pathology. Dissertation: Management of damping-off caused by *Pythium* spp. in organic vegetable production in the Pacific Northwest. Graduated May 2013.
- 2010-11 **Maxwell Handiseni**, WSU Dept. of Plant Pathology. Dissertation: Management of stunting of onion and

- pea caused by *Rhizoctonia*. Left WSU in Jun. 2011 (GPA too low).
- 2007 **Leigh Ann Harrison**, WSU Dept. of Plant Pathology. Dissertation: Management of Fusarium wilt in spinach seed production in the Pacific Northwest. Transferred to Virginia Tech University in Aug. 2007.

PhD committee member (6)

- 2015-18 **Gretchen Freed**, WSU Dept. of Plant Pathology. Dissertation: Fungal pathogens of Native American medicinal herbs in northcentral Washington State.
Valery Moloto, University of Pretoria Forestry & Agricultural Biotechnology Institute, South Africa. Dissertation: Phylogenetic identification of plant pathogenic bacteria from onion seed in South Africa.
- 2014-17 **Olga Kozhar**, WSU Dept. of Plant Pathology. Dissertation: Biology, ecology and population genetics of *Botrytis cinerea* on red raspberry in the Pacific Northwest.
Lukin Wang, WSU Dept. of Plant Pathology. Dissertation: Seed meal amendment in conjunction with rootstock genotype for control of apple replant disease.
- 2009-12 **Lucas Patzek**, WSU Dept. of Crop & Soil Sciences. Dissertation: *Rhizoctonia* diseases in grain-vegetable rotations. Chair: S. Jones. Graduated Jul. 2012.
- 2011 **Sowmya Ramachandran**, WSU Dept. of Plant Pathology. Dissertation: Development of a microarray for bacterial storage rot pathogens of onion bulbs. Student switched programs/project in Aug. 2011.

MS students

MS committee chair (7)

- 2017-19 **Alex Batson**, WSU Dept. of Plant Pathology. Thesis: Identification of pathogenicity-related genes in *Fusarium oxysporum* f. sp. *spinaciae*.
- 2015-17 **Shannon Carmody**, WSU Dept. of Plant Pathology. Thesis: Seedborne aspects of light leaf spot and white leaf spot of brassicas. Graduated Jul. 2017.
John Weber, WSU Dept. of Plant Pathology. Thesis: Management of white mold in sunflower seed crops in the Columbia Basin. Graduated May 2017.
- 2014 **Sean Mullahy**, WSU Dept. of Plant Pathology. Thesis: Management of white mold in sunflower seed crops in the Columbia Basin of Washington. Started in Jan. 2014, left in Aug. 2014.
- 2012-14 **Charles Eric Christianson**, WSU Dept. of Plant Pathology. Thesis: Screening for resistance to *Xanthomonas hortorum* pv. *carotae* in carrot. Graduated Aug. 2014.
- 2005-07 **Jaime Cummings**, WSU Dept. of Plant Pathology. Thesis: Evaluation of organic seed treatments for control of seedling blight/damping-off of spinach. Graduated Dec. 2007.
- 2003-05 **Pablo Hernandez-Perez**, WSU Department of Plant Pathology. Thesis: Seedborne aspects of *Stemphylium* and *Cladosporium* leaf spots of spinach seed crops in WA. Graduated May 2005.

MS in Agriculture online students, committee chair (2)

- 2015-16 **Christeena Sevy**, WSU MS in Agriculture online degree, majoring in Plant Health Management, thesis option. Full-time employee at University of Idaho Parma Research & Extension Center. Non-thesis project: Management of *Verticillium* wilt and lesion nematode in mint. Transferred to Univ. of Idaho in Sep. 2016.
- 2014-16 **Dmitriy Lis**, WSU MS in Agriculture online degree, majoring in Plant Health Management, non-thesis option. Full-time employee at BetaSeed, Inc. Non-thesis project: Screening for resistance to *Aphanomyces* root rot in sugar beet. Graduated Dec. 2016.

MS committee member (10)

- 2016-18 **Umbrin Ilyas**, Department of Plant Agriculture, University of Guelph, Ontario, Canada. Thesis: Mycorrhizae in onion and carrot production. Chair: M.R. MacDonald.
- 2012-16 **Brian Collins**, Department of Plant Agriculture, University of Guelph, Ontario, Canada. Thesis: Management of Fusarium wilt of spinach. Chair: M.R. MacDonald. Graduated spring 2016.
- 2011-13 **Austin Bates**, WSU Dept. of Plant Pathology. Thesis: *Enterobacter cloacae* of onion. Chair: B.K. Schroeder. Graduated summer 2013.
Ziduan (Paul) Han, WSU Dept. of Horticulture. Thesis: Management of *Pratylenchus penetrans* in raspberry production in western Washington. Chair: T.W. Walters. Graduated spring 2013.
- 2010-12 **Segun Akinbade Akinwumi**, WSU Dept. of Plant Pathology. Thesis: Genetic diversity in viruses associated with apple green crinkle disease (AGCD). Chair: K.C. Eastwell. Graduated spring 2012.
- 2009-11 **Angela Iglesias Garcia**, Dept. of Plant Pathology, University of Arkansas, Fayetteville, AR. Thesis:

- Virulence and molecular characterization of *Verticillium* species from spinach. Chair: J.C. Correll. Graduated spring 2011.
- 2008-11 **Sarah Dossey**, WSU Dept. of Plant Pathology (chair = B.K. Schroeder). Dissertation: Enterobacter bulb rot of onion. Chair: B.K. Schroeder. Graduated spring 2011.
- 2007 **Luke Canaday**, WSU Dept. of Plant Pathology. Thesis: Enterobacter storage rot of onion. Chair: B.K. Schroeder. Student resigned in Jul. 2007.
- 2005-08 **Deron Beck**, University of Idaho. Thesis: Management of Botrytis neck rot of onion. Chair: M. Thornton. Graduated Jun. 2008.
- 2002 **Marco Costanigro**, WSU Department of Agricultural Economics. Thesis: Economic aspects of a molecular seed assay for *Botrytis* spp. causing neck rot of onion. Chair: R. Folwell. Graduated in 2003.

Interns (13)

- 2017 (1) **Na'ta'ne (Tawnie) Miles**, Senior undergraduate student from Northwest Indian College (NWIC). Partially funded by WSU Graduate School in support of the NSF AGEP project PNW-COSMOS (Pacific Northwest Circle of Success: Mentoring Opportunities in STEM) for Native American students. Co-mentored with Dr. Brian Compton at NWIC, Jun.-Dec. 2017.
- 2013 (1) **Ed Thomas, WSU Translational Intern**, May-Aug. 2013, partially funded by WSU CAHNRS Internship Program. Co-advised with T. Paulitz, USDA ARS, Pullman, WA. Helped Thomas receive \$4,000 from WSU Office of Student Financial Aid and Scholarships for work-study status for fall 2013.
- 2012 (3) **John Kuhn, WSU Translational Intern**, May-Aug. 2012, partially funded by WSU Academic Programs. **Martha Sudermann**, undergraduate student, St. Olaf's College, MN, 16 Jul.-15 Aug. 2012. **Anita Da Costa**, undergraduate student, University of the Free State, South Africa, 12 Jun. – 12 Jul. 2012.
- 2008-09 (1) With WSU Associate Dean, K. Kidwell, and L. Carris, recruited WSU freshman, **Katie Reed**, for a **Translational Internship** for undergraduates to link between research programs in Pullman and at Research and Extension Centers. \$2,000 from K. Kidwell for each of Carris and du Toit to accommodate Katie Reed. Katie interned again in summer 2009, winter break 2009-10, and summer 2010.
- 2008 (1) **Megan Twomey**, MS student, Dept. of Biology, Western Washington University, summer 2008.
- 2007 (3) **Julia Riske**, The Evergreen State College senior, Apr. - May 2007
Cynthia Hansen, Western Washington University (WWU) junior, Jul. - Sep. 2007
Alyse N. Douglass, WWU junior, Jul.-Oct. 2007 (co-advised with Dr. Brodhagon, WWU molecular biologist).
- 2006 (1) **Coen de Jong**, from van Hall Instituut, Leeuwarden, the Netherlands, for 9 weeks
- 2005 (1) **Blair Baber**, WWU biology senior (WWU Biology 496 credits), summer 2005.
- 2001 (1) **Michael Picha**, WSU sophomore, summer 2001.

High school student Job Shadows (3)

- 2015 (1) **Andrew Wesen**, Burlington Edison High School senior, 13 Mar. 2015.
- 2007 (1) **Katie Reed**, Burlington Edison High School senior, 11 Jan. 2007.
- 2006 (1) **Lacey Hulbert**, La Conner High School senior, 18 Oct. 2006.

High school mentees (1)

- 2016 (1) **Elizabeth Jasek**, Archbishop Alter High School, Ohio. Mentored a science project on composting of disposable plates made of different materials.

EXPERT WITNESS

- 2009 Served in advisory capacity to Snohomish Co. Public Works Department and associated affected agricultural groups at a meeting in Stanwood, WA on 13 Jan. 2009 and numerous subsequent phone calls regarding disease and cross pollination issues of concern for brassica vegetable seed crops and brassica biofuel crops. Controversy was over the potential siting of a canola oilseed crush plant in Stanwood. Due, in part, to my testimony, the crush plant site was moved 30 miles southeast of Stanwood near Munro, WA, outside the WSDA crucifer quarantine area for northwestern WA to avoid threats to the brassica vegetable seed industry.
- 1999 Expert witness deposition in Jun. 1999 for Robert S. White of Costigan & Wollrab, P.C., Attorneys at Law, regarding the case of Peterson v. Tri Central Co-op (File No. 700-482).

SERVICE

- 2017 Judge for La Venture Middle School Science Fair, 28 Mar. 2017, Mount Vernon, WA
- 2016 Judge for La Venture Middle School Science Fair, 29 Mar. 2016, Mount Vernon, WA
- 2015-16 Faculty performance investigation for WSU Provost, Dec. 2015 – Mar. 2016
WSU CAHNRS Office of Research Associate Dean's Faculty Research Advisory Council
- 2015 Search committee member, Plant Diagnostician & Diagnosticis Coordinator/Extension Specialist E2,
WSU Dept. of Plant Pathology
WSU Mount Vernon NWREC Space Committee
- Since 2015 Mentoring Committee for Achour Amiri, Assistant Prof., WSU Dept. of Plant Pathology
- 2014-16 Co-chair, WSU Organic Agriculture Research Coordinating Group. Invited by Office of Research
Director and Associate Dean, James Moyer, to lead efforts within College of Agricultural, Human, &
Natural Research Sciences in research on economically-engaged organic agriculture in the PNW. *Gary
Kotzen, Costco. Global Purchasing Director, stated that our efforts at connecting organic ag
stakeholders in this state resulted in Costco growing their organic feed needs to fuel organic egg
production in the Pacific Northwest.*
- Since 2014 Advisory Committee, Assist. Prof. Lisa Wasko DeVetter, Small Fruit Crops Horticulturist, WSU Mount
Vernon NWREC
- 2014-17 APS Councilor-at-Large. *2016 Councilors' Challenge to APS members that I led resulted in 43% female
invited speakers for the 2017 APS annual meeting vs. an average 20-25% female invited speakers for
APS annual meetings over the past decade.*
- 2014-16 WSU Provost's Advisory Committee on Tenure & Promotion
- 2014-16 WSU CAHNRS Promotion & Tenure Advisory Committee
- 2014-15 Search committee, Nematologist, WSU Department of Plant Pathology
- 2012-14 WSU Center for Sustaining Agriculture & Natural Resources Leadership Team
Graduate Student Admissions Review Committee, WSU Dept. of Plant Pathology. Review graduate
student applications received by the department.
- 2012-13 Search committee, WSU Agricultural Research Director.
- 2012 Search committee, Fiscal Technician, WSU Mount Vernon NWREC, Mar. – Apr. 2012.
Successfully nominated **Dr. Brian Love**, Program Officer for the Gates Foundation, as an adjunct faculty
member at the WSU Mount Vernon NWREC. Love has worked in international agriculture for over a
decade, and supports agricultural development projects in Africa and South Asia. As an adjunct faculty
member he is collaborating with Drs. du Toit and Jones, and organizes research opportunities for
graduate students housed at the NWREC.
- 2011-12 Search committee, Office Assistant III, WSU Mount Vernon NWREC, Nov. 2011 - Feb. 2012.
- 2011 Organizing committee, 35th International Carrot Conference, 30 Nov. – 2 Dec. 2011, Johannesburg, South
Africa. <http://www.carrotconference.co.za/>
Organizing committee, 2011 International Spinach Conference, 3-4 Oct. 2011, Amsterdam, The
Netherlands. <http://spinach.uark.edu/2011Conference.html>
- 2010-14 Advisory Committee, WSU Plant & Pest Diagnostic eXtension Network (PPDeN) Coordinator &
Diagnostician, Karen Flint.
- 2009-10 Search Committee, Agro-Meteorologist/Director of AgWeatherNet, WSU Prosser IAREC.
Chair of Organizing Committee, 34th International Carrot Conference, 26-28 Jul. 2010, Kennewick, WA:
<http://www.pnva.org/carrotconf/>
Organizing Committee, 2010 Soil Fungus Conference, 22-24 Mar. 2010, WSU Mount Vernon NWREC,
Mount Vernon, WA: <http://soilfungus.ars.usda.gov/index.htm>
- 2009-14 Mentoring Committee for Axel Elling, Assistant Prof., WSU Dept. of Plant Pathology.
Graduate Student ByLaws Committee, WSU Dept. of Plant Pathology.
Library Committee, WSU Mount Vernon NWREC.
- Since 2009 Awards Committee, WSU Dept. of Plant Pathology.
- Since 2008 Graduate Student Recruitment Committees, WSU Mount Vernon NWREC and Department of Plant
Pathology.
- 2009 Provided lab training and research discussions on *Xanthomonas hortorum* pv. *carotae* to Bo-Ming Wu,
Assistant Professor, Dept. of Botany & Plant Pathology, Oregon State University, 28-29 Apr. 2009.
Provided 4 days of lab training for Matthew May, Research Associate II from Seminis Vegetable Seeds
in Woodland, CA on Verticillium wilt of spinach and bacterial blight of carrot, 6-9 Apr. 2009.
Organized 'brown bag' lunch panel discussion by videoconference with graduate students in WSU Dept.

- of Plant Pathology and three seed pathologists from private industry, Dick Morrison, Philip Brown, & Traven Bentley, 30 Nov. 2009; provided discussion on maintaining neutrality as an applied public scientist cooperating with private industry.
Successfully nominated Mike Derie for 2009 WSU CAHNRS Academic Professional Excellence Award.
Successfully organized nomination of Debra A. Inglis for 2009 WSU Women's History Award for Academic & Professional Leadership.
- 2008 Developed a proposal, procured funding within WSU (\$50,000) and from private donors (\$8,000), and purchased equipment to set up Core Molecular Lab at WSU Mount Vernon NWREC to enable molecular research for the programs at the NWREC, including real-time PCR analyses.
Search committee, plant pathology assistant professor position, Oregon State University Madras COARC.
Curriculum Review Committee, WSU Department of Plant Pathology.
Diagnostician Position Committee, WSU Department of Plant Pathology.
Ran a WSU Mount Vernon NWREC Journal Club, summer 2008.
Provided 2 days of lab training for V. Hallowell, seed analyst at STA Laboratories, Inc., on assaying spinach seed for necrotrophic fungi, 17-18 Sep. 2008.
Served as host for one day for three Borlaug Fellows completing 3 month internship at WSU on organic agriculture. Toured crops, discussed seed production and disease management, 17 Oct. 2008.
Volunteered at Skagit Co. Fair for a display on the history and significance of vegetable seed production in Skagit Co., put together by D. McMoran, WSU Skagit Co. Extension Educator, 8 Aug. 2008.
Put on a display at 'Science Night' at Mount Vernon High School, Mount Vernon, WA to raise awareness of agricultural and biological careers among elementary, middle, and high school students, 15 May 2008.
- 2007-08 Search committee, Director of WSU Mount Vernon NWREC.
Search committee, Fiscal Agent for WSU Mount Vernon NWREC.
Participated in WSU Dept. of Plant Pathology Journal Club meetings.
WSU Department of Plant Pathology Diagnostics Committee, development of position description for a Pullman-based plant diagnostician.
- Since 2007 Co-coordinator, Pacific Northwest Vegetable Extension Group (formerly WSU Vegetable Pathology Team).
- 2007 Search committee, Grant/Adams Area Extension Educator for WSU Extension.
Search committee, Administrative Manager for WSU Mount Vernon NWREC.
Participated in 'WSU at Benaroya Hall: In Concert with Communities' in Seattle, WA, 6 Sep. 2007. One of 50 faculty featured by the WSU Alumni & Development Office to showcase programs in WSU Extension and CAHNRS that highlight relationships of WSU faculty with community members to fulfill WSU's land grant mission.
Participated in 'Imagine U at WSU' recruiting program at Mt. Baker Middle School, Mount Vernon, WA, 9 May 2007. Six 45-minute presentations to 7th and 8th grade classes on careers in agriculture.
- 2006 Chaired research program discussion, WSU Dept. of Plant Pathology statewide faculty meeting, 8-9 Jun. 2006, Leavenworth, WA.
- 2005-06 Organized 2006 International Spinach Conference, La Conner, WA, 13-14 Jul. 2006.
- 2005-14 Sustainability Committee, WSU Mount Vernon NWREC.
- 2005 Search committee, Office Assistant II position for WSU Mount Vernon NWREC
- 2004-05 Search committee, Grant/Adams Area Extension Educator for WSU Extension.
- 2001-07 Co-coordinator of WSU Vegetable Pathology Team.
- 2001-05 Building/Planning Committee, WSU Mount Vernon Research & Extension Unit, & new facilities at WSU-NWREC.
- 2003-04 Assisted with planning WSU Dept. of Plant Pathology statewide faculty meeting, 24-25 Jun. 2004, LaConner, WA.
- 2002-03 Prepared nomination package for Gary Q. Pelter for 2003 WSU Extension Excellence Award.
Coordinator of WSU Vegetable Seed Pathology Extension Program.
- 2001-03 Plant Clinic Advisory Committee for WSU Department of Plant Pathology.
- 2002 Search Committee for Sam Smith Endowed Virology Professorship for WSU Dept. of Plant Pathology.
- 1999-2000 Website Planning Committee for WSU Puyallup Research & Extension Center.

EDITING/REVIEWS

Grant panels

- 2017 WSU Center for Sustaining Agriculture & Natural Resources BIOAg proposal review, Jan. 2017.
- 2016 USDA NIFA AFRI grant review panel for FY2016 Foundational Program A1102, Washington DC., Oct. 2016.
WSDA Specialty Crop Block Grant review panel, May 2016.
WSU Center for Sustaining Agriculture & Natural Resources BIOAg proposal reviews, Jan. 2016.
WSU Emerging Research Issues proposal reviews, Jan. 2016.
- 2013 Austrian Science Fund, reviewed proposal I 1500-B16, June 2013.
- 2012 BARD: The US-Israel Agricultural Research & Development Fund, reviewed proposal US-4614-13.
- 2010, 2012 WSU BioAg proposal reviews, Apr. 2010, Jan. 2012, Jan. 2013.
- 2006 North Central IPM Center review panel, 19 Apr. 2006, St. Louis, MO.

Journals and books

- 2015 External reviewer of 47-chapter book for American Phytopathological Society (APS) Press.
- 2013-15 Senior Editor, *Plant Disease*, APS Press.
- 2010-12 Senior Editor, *Plant Disease*, APS Press.
- 2009-11 Associate Editor, *Phytopathology*, APS Press.
- 2008-11 Associate Editor, *Agronomy Journal*, Crop Science Society of America (Aug. 2008 – Jul. 2011).
- 2006-09 Section Editor for Volumes 1, 2, and 3 of *Plant Disease Management Reports*.
- 2005-06 Section Editor for Vol. 61 of *Fungicide & Nematicide Tests*, APS Press.
- 2005 External reviewer of a plant disease compendium for APS Press.
- 2000-02 Associate Editor, *Plant Disease*, APS Press.
- Ad-hoc reviewer: *Australian Journal of Experimental Agriculture* (2005), *Australasian Plant Disease Notes* (2012), *Canadian Journal of Plant Pathology* (since 2004), *Crop Management* (since 2009), *Crop Protection* (since 2005), *European Journal of Plant Pathology* (since 2007), *Fungal Biology* (2012), *HortScience* (since 2007), *HortTechnology* (since 2005), *Journal of Phytopathology* (since 2005), *Letters of Applied Microbiology* (since 2009), *Pacific Northwest Fungi* (2005), *Phytoparasitica* (since 2005), *Phytopathology* (since 2005), *Plant and Soil* (2016), *Plant Disease* (since 2002), *Plant Health Progress* (since 2004), *Plant Pathology* (since 2006).

Bulletins, popular periodicals, theses/dissertations, promotion packages, project proposals

- 2016 External reviewer, Oregon State University extension manuscript 2016-007 on clubroot of brassicas.
External reviewer, application for promotion to Senior Faculty Research Assistant II, Department of Botany and Plant Pathology, Oregon State University.
- 2015 External reviewer, standardized seed health assay protocol titled 'Methods for the Detection of *Verticillium dahliae* on Spinach Seed', and '7-0XX Detection of *Verticillium dahliae* on *Spinacia oleracea* (spinach) seed. International Rules for Seed Testing. Annexe to Chapter 7: Seed Health Testing Methods' for the International Seed Federation, Bassersdorf, Switzerland.
External reviewer, National Research Foundation, South Africa, for national ranking of a plant pathologist at University of Pretoria, South Africa.
External reviewer, promotion to Full Professor for a faculty member, Dept. of Plant Pathology, University of Florida.
External reviewer, promotion of a Faculty Research Assistant to Senior Faculty Research Assistant I, Department of Botany and Plant Pathology, Oregon State University.
- 2014 External reviewer, promotion to Associate Professor for a faculty member, Department of Plant Pathology at Stellenbosch University.
External reviewer, promotion to Senior Instructor II for a faculty member, Department of Botany & Plant Pathology at Oregon State University.
External reviewer, promotion to Full Professor for a faculty member, Cornell University.
Reviewed three WSU CSANR BioAg progress reports.
Reviewed Hatch proposal for a faculty member in the WSU Dept. of Plant Pathology.
External reviewer, two WSU extension bulletins.
- 2013 External reviewer, National Research Foundation, South Africa, for national ranking of a plant pathology faculty member, University of KwaZulu Natal, South Africa.

- Reviewed Hatch proposal for faculty member in WSU Dept. of Plant Pathology.
Reviewed 6 project plans for the USDA ARS NP 301 (Plant Genetic Resources, Genomics, and Genetic Improvement National Program) for 5-year projects for Panels 8A and B (sugarbeet).
Reviewed two extension bulletins for WSU CAHNRS.
- 2012 External examiner, MS thesis, University of the Witwatersrand, Johannesburg, South Africa.
Reviewed Hatch proposal for faculty member in WSU Dept. of Plant Pathology.
- 2011 External reviewer, National Research Foundation, South Africa, for national ranking of a plant pathology faculty member at the University of Pretoria, South Africa.
External examiner, PhD dissertation, Lincoln University, Christchurch, New Zealand.
- 2010 External reviewer, promotion application of Monterey County Cooperative Extension Farm Advisor, University of California Agriculture & Natural Resources.
External reviewer, promotion of faculty member at Texas A&M University.
Reviewed disease aspects of 21 crop profiles for Washington State Commission for Pesticide Registration (WSCPR) Compendium of Washington Agriculture, Mar. 2010.
- 2009 External reviewer, National Research Foundation in South Africa of national ranking of plant pathology faculty member at University of Pretoria, South Africa.
- 2008 External reviewer, promotion of a faculty member at the Dept. of Plant Pathology, University of California Davis.
- 2005 Reviewed Crop Profiles for spinach seed, cabbage seed, and beet seed production in Washington. USDA National Pest Management Centers, <http://pestdata.ncsu.edu/cropprofiles/Cropprofiles.cfm>.
- Since 2005 Internal reviewer, CRIS proposals for WSU Dept. of Plant Pathology
- 2005 Reviewed Hatch proposal for Idaho Agricultural Experiment Station and Plant, Soil, & Entomological Sciences Department, University of Idaho.
- since 2004 Ad-hoc reviewer, articles in popular periodicals, e.g., *Carrot Country*, *Growing*, *Onion World*, *Seed World*.
Reviewed Organic Seed Alliance articles on organic seed production and seedborne diseases.
- since 2000 Internal review, manuscripts for WSU Dept. Plant Pathology, USDA faculty, and University of Idaho.
- 2004 Reviewed bulletin “Stemphylium leaf spot of spinach” for Seminis Vegetable Seeds, Inc.
- 2003-04 Reviewed plant pathology bulletins for Washington Toxics Coalition, Seattle, WA.
- 2003 External examiner, PhD dissertation, University of Tasmania, Australia.
- 1999-2007 Submitted contributions & revisions for *Pacific Northwest Plant Disease Management Handbook* published by WSU, Oregon State University, & University of Idaho.

AWARDS

APS:

- 2013 APS Syngenta Award for outstanding recent contributions to research/extension in plant pathology.
2006 APS Pacific Division Early Career Award

WSU:

- 20-13 Certificate of Recognition for being nominated for 2013 WSU ‘Distinguished Service Award – Faculty’ for promoting Martin Luther King’s principles of human rights and social justice.
- 2012 WSU CAHNRS Interdisciplinary Team Excellence Award for the Pacific Northwest Vegetable Extension Group (PNW VEG).
- 2012-16 Alfred Christianson Endowed Professorship for research & extension activities on vegetable seed crops in WA.
- 2009 WSU Kenneth J. Morrison Extension Award for outstanding contributions to the improvement of Washington State’s crop production
- 2006-10 Alfred Christianson Endowed Professorship for research & extension activities on vegetable seed crops in WA.
- 2004 WSU Extension Digital Photo Contest, Aug. 2004, titled “Onion seed crop in bloom in the Columbia Basin”.
- 2002-05 Alfred Christianson Endowed Professorship for research & extension activities on vegetable seed crops in WA.
- 2000 WSU Karl Hobson Memorial Fund Award to attend the 9th Annual Virus Inclusion Workshop in Gainesville, FL, 29-31 Jan. 2001
- 1999 WSU Karl Hobson Memorial Fund Award to attend the APS Annual Meeting in New Orleans, LA, 12-16 Aug. 2000

UIUC:

- 1997-98 Illinois Seed Trade Association's Burlison Award
Floyd Ingersoll Graduate Fellowship
- 1997 Outstanding Paper Presentation at 35th Congress of SASPP, 19-22 Jan. 1997
APS Foundation I.E. Melhus Graduate Student Speaker – presentation on “Disease resistance: The key element of sweet corn IPM programs” at 1997 APS meeting in Rochester, NY for the colloquium “IPM as a Central Component of Host Resistance”
- 1996-97 Floyd Ingersoll Graduate Fellowship
- 1996 Travel grants to present two papers at 35th Congress of SASPP, 19-22 Jan. 1997: Sigma Xi (University of Illinois Chapter) Travel Grant; Graduate College Conference Travel Grant; Department of Crop Sciences Travel Grant
American Phytopathological Society Note Card picture contest
- 1995-96 Department of Crop Sciences Graduate Fellowship
- 1995-98 Research Assistantship & Tuition Waiver under Prof. Jerald K. Pataky & Mrs. Nancy R. Pataky
- 1994 “Incomplete List of Teachers Ranked as Excellent by Their Students” (for Agron. 340)
- 1992-94 Research Assistantship & Tuition Waiver under Prof. H. Walker Kirby
- UNP:
- 1992 FRD Travel Funding to begin a Masters degree at University of Illinois at Urbana-Champaign
- 1991 FRD Honors Bursary
University of Natal Scholarship
- 1990 Foundation for Research Development (FRD) Undergraduate Scholarship
University of Natal Prestige Undergraduate Scholarship
- 1989 Emma Smith Bursary
University of Natal Undergraduate Scholarship
Dr. Donges Memorial Trust Bursary
- 1988 Standard Bank Scholarship
Dr. Donges Memorial Trust Bursary

EXTENSION PROGRAMS

- since 2001 Pacific Northwest Vegetable Extension Group (PNW VEG), formerly WSU Vegetable Pathology Team. Collaboration of WSU, University of Idaho, and Oregon State University vegetable horticulturalists, pathologists, entomologists, extension educators, & diagnosticians to address problems in vegetable crops in the Pacific Northwest. Conference calls; workshops; newsletters; website on the PNW vegetable industry (http://mtvernon.wsu.edu/path_team/vegpath_team.htm), images of vegetable diseases, & newsletters; assistance with timely/accurate diagnoses of vegetable diseases, pests & disorders; & recommendations for disease & pest management. Co-coordinator with D.A. Inglis (2001-09), Coordinator (2007-09), Co-coordinator with D.A. Inglis and C.A. Miles (since 2009). Received the 2012 WSU CAHNRS Team Excellence Award.
- 2007-2010 WSU Seed Crops IPM Extension Team. Led by entomologist [Doug Walsh](#) and plant pathologist [Lindsey du Toit](#), this team seeks to protect and enhance seed industries of Washington State. Other team members include weed scientists [Tim Miller](#) and [Rick Boydston](#), plant pathologists [Lyndon Porter](#) and [Ken Eastwell](#), Extension educators [Tim Waters](#), [Don McMoran](#), and [Carrie Wohleb](#), and communications specialist [Sally O'Neal](#). The Team brings together faculty and staff state-wide from numerous disciplines to address issues impacting production of many types of seed crops. Website provides resources to stakeholders on seed crop IPM: <http://ipm.wsu.edu/seedcrops/seedcrops.html>

RESEARCH & EXTENSION CONTRIBUTING TO FUNGICIDE/BACTERICIDE REGISTRATIONS

- 2016 Provided research documentation and letters of support to renew **Section 24(c) Special Local Needs (SLN)** seed treatment registration by WSDA for **iprodisone (Rovral Fungicide, FMC Corp.)** in crucifer seed crops, EPA Reg. No. 279-9564, WSDA SLN No. WA-160007, for control of black leg, light leaf spot, and white leaf spot of crucifers.
- 2015-16 Provided research documentation and letters of support to renew **Section 24(c) Special Local Needs (SLN)** seed treatment registration by WSDA for **thiophanate-methyl (Topsin M 70WP, United Phosphorus, Inc.)** in spinach seed crops for control of seedborne *Verticillium dahliae*; and for obtaining the same SLN spinach seed treatment registration in Oregon, approved by the Oregon Dept. of Agriculture (ODA).

- Provided research data and support letter to renew **Section 24(c) Special Local Needs (SLN)** registration by WSDA for **chlorothalonil** (Bravo WeatherStik Agricultural Fungicide) in spinach and Swiss chard seed crops in the Pacific Northwest.
- 2012-17 Provided research documentation and letters of support for **Section 24(c) SLN EPA registrations** for **prothioconazole (Proline, Bayer Crop Science)** in non-food/non-feed spinach, brassica, table beet, and Swiss chard seed crops by WSDA and ODA in Washington and Oregon States, respectively. ODA SLNs OR-150016 for spinach and OR-150017 for brassicas approved in Jan. 2016. WSDA SLNs WA-160003 for brassica seed crops and WA-160004 for spinach seed crops approved in May 2016. WA-170011 approved for table beet and Swiss chard seed crops on 1 May 2017.
- 2013-14 Provided documentation and letters in support of renewing the WSDA **Section 24(c) SLN EPA registrations** for **Manzate Pro-Stick Fungicide** (mancozeb, United Phosphorus, Inc.) in non-food/non-feed vegetable seed crops, and **Switch 62.5 WDG** (fludioxonil + cyprodinil) in brassica vegetable seed crops in Washington State.
- 2009-13 Provided research data and technical support that resulted in a **Section 3 federal spinach seed treatment registration of Rancona Spinach** (ipconazole, Chemtura AgroSolutions) for control of *Verticillium* and several other fungal spinach pathogens, approved in Jan. 2013.
- 2012 Provided letters of support and technical advice for **SLN registration for Roper DF Rainshield** (mancozeb, Loveland Products, Inc.) to replace Dithane DF Rainshield (mancozeb, Dow AgroSciences) in vegetable seed crops in Washington State.
Provided technical advice and data to the OR Dept. of Agriculture in support of a **SLN registration for Endura** (boscalid, BASF Corp.) for use in radish seed crops in Oregon State.
- 2011 Provided documentation and support for WSDA **SLN registration No. WA-110008** issue to Syngenta Seeds, Inc. for the use of **DryTec Calcium Hydrochloride Granular** to treat pepper seed for seedborne bacterial pathogens.
- 2009-15 Provided research results from 4 years of field and greenhouse trials in WA and CA, including plant samples for residue testing, towards a **Section 3 federal (national) spinach seed treatment registration of thiabendazole (Mertect 340F, Syngenta Crop Protection)** for management of seedborne *Verticillium* in spinach. Federal registration approved July 2014. California registration expected July 2015.
- 2009 Provided research documentation in support of renewing the **Section 24(c) SLN EPA registration** (EPA No. 62719-396) for **Dithane F45 Rainshield (mancozeb)** in small-seeded vegetable seed crops in Washington & Oregon. Registrations approved by WSDA and OR Dept. of Agric. (ODA) to replace Dithane DF SLN registrations.
- 2008-09 Provided letter of support and research results from 2006-08 in support of a **Section 24(c) SLN seed treatment registration** by WSDA and ODA for **thiophanate-methyl (Topsin M 70WP, United Phosphorus, Inc.)** in spinach seed crops for control of seedborne *Verticillium dahliae*, granted by WSDA in 2009. Federal seed treatment registration on spinach requested in 2009 but denied after EPA declared the 'risk cup' was full based on existing registrations of this product. Seed companies in the EU are using the same results.
Provided field research to support adding brassica vegetable seed crops to the federal label for **copper hydroxide + mancozeb (ManKocide, DuPont)**.
- 2008 **Boscalid + pyraclostrobin (Coronet, BASF Corp.)** federal seed treatment registration approved by Environmental Protection Agency (EPA), WSDA, and California Dept. of Food & Agriculture (CDFA) for brassica and bulb vegetable crops. Approval based in part on >4 years of seed treatment trials for seedborne and soilborne pathogens of onion, brassicas, and spinach by this program.
Provided supporting data for **Section 24(c) SLN registrations** by WSDA and Oregon Dept. of Agriculture (ODA) for **myclobutanil (Rally, Dow AgroSciences)** for control of powdery mildew in carrot seed crops.
Provided support for renewing **Section 24(c) SLN registration** for **cyprodinil + fludioxonil (Switch 62.5WG, Syngenta Crop Protection)** for management of Alternaria leaf/pod spot and white mold in crucifer seed crops in Washington.
- 2007 Provided information and research-based documentation in support of renewing the **Section 24(c) SLN EPA registration** for **Iprodione 4L AG (iprodione)** in brassica vegetable seed crops in Washington; and for renewing **Section 24(c) SLN EPA registration** for **Dithane DF Rainshield (mancozeb)** in small-seeded vegetable seed crops in Washington.
- 2004-08 **Boscalid + pyraclostrobin (Pristine WG, BASF Corp.), iprodione** (Rovral 4F, DuPont Agricultural Products), and **thiabendazole (Mertect 340F, Syngenta Crop Protection)**. Results of trials used by American Seed Trade Assoc. Flower & Vegetable Technical Subcomm. to pursue Section 18 emergency & federal seed treatment registrations to replace benomyl for control of seedborne *Phoma lingam* (black leg) on crucifers.

- Section 18** emergency use registration approved in Nov. 2006 (EPA Nos. 06-WA-02, 06-WA-03, & 06-WA-04) & in Nov. 2007 (EPA Nos. 08-WA-01, 08-WA-02, & 08-WA-03) for **Mertect 340F seed treatment** of Brussels sprouts, cabbage, & cauliflower seed in California and Washington. **Section 24(c) (SLN)** EPA Registration No. WA-070001 & CA-060020 approved for **Rovral 4F** crucifer seed treatment for seed crop production in WA and CA.
- 2004-06 **Acibenzolar-S-methyl (Actigard, Syngenta Crop Protection)**. Field trials to evaluate this reduced-risk product & neonicotinyl insecticides for management of thrips & *Iris yellow spot virus* in onion bulb/seed crops in WA.
- 2004-05 **Mancozeb-copper hydroxide (ManKocide DF, DuPont Agricultural Products)**. Results of field trials supported Environmental Protection Agency (EPA) Section 24(c) Special Local Needs (SLN) Registration No. WA-030030 approved by WA State Department of Agriculture (WSDA) for carrot seed crops in WA.
- 2004 **Chlorothalonil (Bravo WeatherStik, Syngenta Crop Protection)**. Results of field research trials supported extension of EPA SLN Registration No. WA-950036B on spinach & Swiss chard seed crops in WA. **Cymoxanil (Curzate 60DF, DuPont Agricultural Products)**. Results of research trials supported addition of table beet & Swiss chard seed crops to EPA SLN Registration No. WA-990021 for downy mildew in WA. **Thiram** (various formulations). Collated information on thiram use in vegetable & vegetable seed crops in WA, as requested by EPA & WSU Pesticide Notification Network for regulatory purposes.
- 2003 **Pyraclostrobin (Cabrio EG, BASF Corp.)**. EPA SLN Registration No. WA-030021 granted by WSDA for 2003-08 for Alternaria leaf/pod spot & ring spot in Crucifer seed crops in WA, based on research trials.
- 2002 **Cyprodinil + fludioxonil (Switch 62.5 WG, Syngenta Crop Protection)**. EPA SLN Registration No. WA-020016 granted by WSDA from 2002-07 for Alternaria leaf/pod spot & white mold in Crucifer seed crops.

RESEARCH & EXTENSION CONTRIBUTING TO CROP REGULATORY ISSUES

- 2014-16 Participated in many meetings with Oregon Department of Agriculture (ODA) and WSDA as well as Oregon State University following a widespread outbreak of black leg (*Phoma lingam*), light leaf spot (*Cylindrosporium concentricum*), and white leaf spot (*Mycosphaerella capsellae*) in the Willamette Valley of OR in 2014 on various crucifer crops, including fresh market and processing vegetable crops, vegetable seed crops, oilseed crops, cover crops, forage crops, and wild brassicas. Light leaf spot had never been documented in North America prior to this. Provided seed treatment research results and publications to ODA and companies in support of ODA seed treatment registrations for brassica crops for managing black leg. ODA implemented emergency ruling in July 2014 requiring testing of all brassica seed lots for the black leg pathogen for any seed lots planted in western OR. Permanent ODA ruling implemented in Jan. 2015. ODA utilized WSDA Crucifer Quarantine to develop the ruling, with input from du Toit's vegetable seed pathology research and extension program. Participated extensively in meetings with WSDA and crucifer (seed crop, oilseed, cover crop, etc.) growers and seed companies in WA, OR, and ID on expanding WSDA Crucifer Quarantine to protect counties east of the Cascade Mountains from black leg. See related invited presentations, workshops, etc. listed above. Additional OR conference calls on 28 Apr., 2 May, & 16 May 2016.
- 2014-15 WSDA bean seed quarantine: Helped with diagnosis and management recommendations for bean seed grower for a crop diagnosed with halo blight (*Pseudomonas syringae* pv. *phaseolicola*), a quarantine disease in the Columbia Basin of WA. Worked with WSDA Seed Program Manager, Victor Shaul, and bean stakeholders (growers/seed companies) to address deficiencies in current quarantine rules, and identify potential modifications to the rules to protect the WA bean seed industry.
- 2014-16 WSDA Allium white rot quarantine: Diagnosed white rot (*Sclerotium cepivorum*) in an onion seed crop in the Columbia Basin of WA, a quarantine area for the disease. Worked with the grower, seed company personnel, and WSDA to develop a mitigation plan for the infested field. Held multiple discussions with affected parties and onion stakeholders to identify deficiencies in current WSDA quarantine rules, and for future modifications to the WSDA rule to avoid introduction of the pathogen into other fields and to protect the WA onion bulb and seed industry.
- 2012-15 Invited by American Seed Trade Association (ASTA) and European seed industry to work with USDA Animal and Plant Health Inspection Service Plant Protection Quarantine (APHIS PPQ) division to address a phytosanitary quarantine implemented by APHIS PPQ in 2012 on the fungus, *Phomopsis*, on spinach seed imported into the USA. The quarantine resulted in >\$40 million worth of spinach seed lots rejected at USA ports of entry, and losses to the USA spinach industry as a result of limited seed supplies of hybrids and cultivars in high demand and destruction of some lots. Wrote an emergency grant proposal, 'Phomopsis

on spinach seed: Evaluation of a seed health assay, efficiency of seed treatments, and pathogenicity of seed isolates on spinach' to procure ASTA funding for research to enable this controversial quarantine to be resolved and regular spinach seed trade between the EU and USA to resume.

2006-07 WSDA Canola/Rapeseed regulations developed to define regions of Washington for vegetable crucifer seed production, to avoid conflicts from cross-pollination, volunteers, & diseases/insects from other crucifers.

Since 2004 WSDA Crucifer Seed Quarantine rule: WA Administrative Code (WAC) 16-301-490 to 16-301-580 was implemented in Jan. 2006 to support Brassica vegetable seed industry in 6 counties in NW Washington from risks of two seedborne pathogens (*Phoma lingam* and *Xanthomonas campestris* pv. *campestris*) and dormant seed in non-vegetable crucifer seed lots. Ruling was developed by WSDA Seed Program's Crucifer Working Group on which I serve in an advisory capacity. I continue to serve in this capacity regarding revisions to the ruling, as needed. In addition, I serve in an advisory capacity regarding the WSDA Crucifer Districts (WAC 16.326 Sections 010-060), which were revised over the past 10 years to accommodate diverse crucifer stakeholder needs.

MULTI-STATE PROJECTS

2007-12, 2012-16 W-2008. Biology and Management of *Iris yellow spot virus* (IYSV) and Thrips in Onion. Secretary (2015-16), Vice-chair (2016-17), Chair (2016-17).

2008-12, 2013-18 W-3147 (W-2421). Managing Plant Microbe Interactions in Soil to Promote Sustainable Agriculture. Washington State Program Lead with T. Paulitz.

2005-11 WERA-069. Coordination of Integrated Pest Management Research and Extension/Educational Programs for the Western States & Pacific Basin Territories.

GRANTS

(* indicates principal or co-principal investigator. 1) Provided the initial idea, 2) Developed research design and hypotheses, 3) Authorship of grant application, 4) Developed and/or managed budget, 5) Managed personnel and project activities.)

Received

2017-21 Developing genetic and molecular resources to improve spinach production and management. USDA NIFA Specialty Crop Research Institute (SCRI). Shi, A., Correll, J., Feng, C., Mou, B., Avila, C., Stein, L., Enciso, J., and Koike, S. \$285,784 of \$2 million for du Toit. \$285,784

2017-19 * Robert MacDonald Graduate Fellowship in Vegetable Seed Science in support of graduate student, Alex Batson, to identify pathogenicity-related genes in *Fusarium oxysporum* f. sp. *spinaciae*. du Toit, L.J. \$16,000/year for three years. \$48,000

2017 * Evaluation of irrigation management and ManKocide application for control of onion internal dry scale and associated bacterial bulb rots. 1-year proposal submitted to Columbia Basin Onion Research Commission (CBORC) in Nov. 2016. du Toit, L.J. and Waters, T.W. \$13,953. \$13,953

Onion pest and disease monitoring network and WSU Onion Alert System. Proposal submitted to CBORC in Nov. 2016. Wohleb, C.H., and Waters, T. (co-PIs), and du Toit, L.J. (collaborator). \$4,104

¼-time Graduate Research Assistantship for spring semester of 2017 for MS student, Shannon Carmody. WSU Department of Plant Pathology. \$6,810

* Identification of pathogenicity-related genes in *Fusarium oxysporum* f. sp. *spinaciae*. Puget Sound Seed Growers' Assoc. (PSSGA) via Northwest Agricultural Research Foundation (NARF) (\$22,754); + WA State Commission for Pesticide Registration (WSCPR) (\$19,944). du Toit, L.J. \$42,698

* Managing thrips and IYSV in seed and dry bulb onions in Washington State. Columbia Basin Vegetable Seed Assoc. (CBVSA) (\$5,000) + matching funding from WSCPR (\$5,000). Waters, T., Wohleb, C., and du Toit, L.J. \$10,000

- * Efficacy of seed treatments for management of *Colletrotichum* on spinach seed. Texas Wintergarden Spinach Producers' Board. du Toit, L.J. \$6,000
- 2017 PNW VEG Vegetable Quarantine Disease and Pest Workshop. Western SARE Professional Development Program. 2017. du Toit, L.J., Inglis, D.A., Glass, J., and Bomberger, R. \$2,500
- * WSU Graduate School internship funding for a Native American student, Na'ta'ne Miles, from Northwest Indian College (NWIC), in support of NSF-AGEP project PNW-COSMOS for engaging Native American students in STEM fields of study. Jun.-Dec. 2017. \$5,000
- 2016-20 Identifying phenotypes, markers, and genes in carrot germplasm to deliver improved carrots to growers and consumers. USDA Specialty Crops Research Initiative (SCRI). Simon, P., Colley, M., Dawson, J., Tanumihardjo, S., Spooner, D., Spalding, E., Nunez, J., Van Deynze, A., Sumner, D., Roberts, P., du Toit, L. Waters, T., Iorizzo, M. \$127,393 of \$4.0 million for du Toit/Waters for a 4-year project. \$127,393
- CIOA2 – Carrot Improvement for Organic Agriculture with Added Grower and Consumer Value. USDA Organic Research & Extension Initiative (OREI). Simon, P., Colley, M., Hoagland, L., Roberts, P., McKenzie, L. Zystro, J. du Toit, L., Nunez, J., Silva, E., and Waters, T. \$112,856 of \$2.0 million for du Toit and Waters for a 4-year project. \$112,856
- 2016 * Management of white mold in sunflower seed production in the Columbia Basin. du Toit, L.J. WSCPR (\$19,584) + \$15,000 from Precision Seed Production, LLC. \$34,584
- * Managing irrigation for control of onion internal dry scale and bacterial bulb rots. du Toit, L.J., and Waters, T.W. Pacific Northwest Vegetable Assoc. (PNVA). \$5,000
- * Managing thrips and IYSV in seed and dry bulb onions in Washington State. Waters, T.W., Wohleb, C.H., & du Toit, L.J. WSCPR (\$11,250) matching funding for PNVA (\$5,000) + CBVSA (\$5,000) + chemical companies (\$16,000 from Bayer CropScience, DuPont, Syngenta Crop Protection) \$37,250
- * *Phoma betae* in table beet and Swiss chard seed crops in Washington State. du Toit, L.J. PSSGA via NARF (\$16,900) + WSCPR (\$11,968). \$28,868
- 2015-19 A multidisciplinary approach for damping-off resistance in spinach. Proposal submitted to European Union Topsector Horticulture and Planting Materials Program on 15 Sep. 2014. Collaborative proposal with Lammerts van Bueren, E. (Wageningen University, Netherlands); Groot, S.P.C., Scholten, O.E., and Postma, J. (Plant Research International, Netherlands); and seed company personnel from Enza Zaden, Netherlands; Pop Vriend, Netherlands; Bayer CropScience Vegetable Seeds, Netherlands; Syngenta Seeds B.V., Netherlands; and Sakata Holland, Netherlands. U.S. collaborators include du Toit, L.J., Myers, J., and Koike, S.T. €1,572,500. Financial support for U.S. research to be paid by seed companies. \$0
- 2015-18 * du Toit, L.J., and Waters, T.D. Evaluation of arbuscular mycorrhizal fungi for enhanced growth, phosphorus use efficiency, and management of soilborne pathogens of onion and carrot in the Columbia Basin. Washington State Department of Agriculture (WSDA) Specialty Crop Block Grant (SCBG). 30 Sep. 2015 – 30 Apr. 2018. \$211,099
- 2015-17 Clif Bar Family Foundation Seed Matters Graduate Fellowship for MS student, Shannon Carmody, to work on organic seed pathology. \$50,000
- Seed transmission and management of white leaf spot and light leaf spot pathogens in Brassicas in the Pacific Northwest. S. Carmody and L. du Toit. USDA Western Sustainable Agriculture Research & Education Graduate Student Fellowship. \$15,675
- 2015-16 Oregon State University support of the PNW VEG team. Hamm, P., du Toit, L.J., Miles, C., Inglis, D. \$1,000

- 2015 ¼-time Graduate Research Assistantship for Spring and Fall semesters of 2015 for MS student, Shannon Carmody, to investigate management of seedborne/soilborne diseases in organic vegetable production. WSU Department of Plant Pathology. \$3,479 x 2 semesters. \$6,958
- * du Toit, L.J. Management of white mold in sunflower seed production in the Columbia Basin. WSCPR (\$18,846) + Precision Seed Production, LLC (\$15,000) \$33,846
- * du Toit, L.J. Prevalence and significance of seedborne *Pseudomonas syringae* pv. *aptata* in table beet and Swiss chard seed crops in Washington State. PSSGA via NARF (\$28,766) + WSCPR (\$17,326). \$46,092
- * Waters, T.D., and du Toit, L.J. Evaluation of fungicides for management of neck rot and black mold in onion bulb production in the Columbia Basin. \$2,500 from PNVA + \$15,400 from Bejo Seeds, DuPont, and Gowan. \$17,900
- * WSU Extension funding for Vegetable Seed Pathology program. du Toit, L.J. \$3,000
- * WSU Extension funding for Pacific Northwest Vegetable Extension Group. du Toit, L.J., Inglis, D.A., and Miles, C. \$2,000
- 2014-17 Pacific Northwest Collaborative Opportunities for Success in Mentoring of Students (PNW-COSMOS). National Science Foundation Alliances for Graduate Education and the Professoriate (NSF AGEP) program. Alliance of WSU, University of Idaho, Montana State University, and University of Montana to increase participation by American Indian (AI) students in STEM doctoral program. Carris, L. and Ward, K. = WSU PIs. du Toit, L.J. = one of ~10 faculty recruiting AI students from various institutions in WA. (\$596,854 = WSU share of total budget, including travel expenses for du Toit) \$0
- 2014-15 * WSU Extension funding for Vegetable Seed Pathology program. du Toit, L.J. \$3,000
- Oregon State University support of the PNW VEG team. Hamm, P., du Toit, L.J., Miles, C., Inglis, D. \$1,000
- 2014 * Management of Verticillium and Fusarium wilts in spinach seed production. du Toit, L.J. PSSGA (\$26,935) via NARF + WSCPR (\$22,720). (1,2,3,4,5) \$49,722
- * Impact of arbuscular mycorrhizal fungi on P use efficiency and root diseases of onion crops. du Toit, L.J., Paulitz, T., and Sharma Poudyal, D. WSU CSANR BioAg program. (1,2,3,4,5) \$40,000
- * Management of white mold in sunflower seed crops in the Columbia Basin. du Toit, L.J. and Chen, W. (USDA ARS). Precision Seed Production, Inc. (\$15,000) + WSCPR (\$26,247) (1,2,3,4,5) \$41,247
- * WSU Extension funding for Vegetable Seed Pathology program. du Toit, L.J. \$3,000
- 2013-14 * *Phomopsis* on spinach seed: Evaluation of a seed health assay, efficiency of seed treatments, and pathogenicity of seed isolates on spinach. du Toit, L.J. Invited to write and submit this emergency grant on behalf of the American Seed Trade Association (ASTA) to procure funding for research to resolve a highly controversial quarantine issue and, therefore, resume spinach seed trade between the EU and USA. American Seed Research Foundation of the ASTA. \$25,000
- * Potential benefits of arbuscular mycorrhizae in conventional and organic onion production in the Columbia Basin of Washington and Oregon. D. Sharma-Poudyal, postdoctorate; du Toit, L.J., Paulitz, T., USDA ARS; and Linderman, B. Plant Health LLC. PNVA. \$11,500
- * Screening carrot germplasm for resistance to *Xanthomonas hortorum* pv. *carotae*. du Toit, L.J. CBVSA for support of MS student, Eric Christianson. \$5,000

- * WSU CAHNRS Undergraduate Research and Extension Internship for Ed Thomas in summer 2013. Paulitz, T.C. (USDA ARS) and du Toit, L.J. \$2,500
- 2013 * Support from Oregon State University administration for the Pacific Northwest Vegetable Extension Group's activities in 2013. \$1,000
- * Management of *Verticillium* and *Fusarium* wilts in spinach seed production. du Toit, L.J. PSSGA (\$26,638) via NARF + WSCPR (\$22,124 matching funding). (1,2,3,4,5) \$48,762
- * WSU CAHNRS work study funding for undergraduate student, Ed Thomas, for fall 2013 and spring 2014. Paulitz, T. C., and du Toit, L.J. \$4,000
- * WSU Extension funding for Vegetable Seed Pathology program. du Toit, L.J. \$3,000
- 2012-15 Managing downy mildew of spinach: A genomics approach to the host and the pathogen. J.C. Correll, B.H. Bluhm, S.T. Koike, L.J. du Toit, K.H. Lamour, and D.N. McRoberts. USDA SCRI. \$62,228 for du Toit of \$973,818 requested (3 year project). (2,3) \$62,228
- 2012-13 * Management of damping-off in organic pea production in the Pacific Northwest. L.J. du Toit. WSU CSANR BioAg Program, support of PhD student, A.C. Alcalá. (1,2,3,4,5) \$35,306
- * ¼-time Graduate Research Assistantship for Fall 2012 and Spring 2013 semesters for MS student, Charles Eric Christianson, to investigate breeding for resistance to bacterial blight of carrot. WSU Department of Plant Pathology. (1,2,3,4,5) \$13,253
- * Support for MS student, Charles Eric Christianson, to investigate breeding for resistance to bacterial blight of carrot. WSU Mount Vernon NWREC F&A funding. (\$5,000 + \$1,000) \$6,000
- 2012 * WSU Translational Internship for undergraduate student, John Kuhn, funded by WSU Academic Programs. (1,2,3,4,5) \$2,500
- * ¼-time Graduate Research Assistantship for Spring 2012 semester for PhD student, Emily Gatch, to investigate management of *Fusarium* wilt in spinach seed production. WSU Department of Plant Pathology. (1,2,3,4,5) \$6,106
- * Management of *Fusarium* wilt of spinach seed crops in western Washington. du Toit, L.J. \$7,000 from Robert MacDonald Vegetable Seed Memorial Fund for partial support of PhD student, Emily Gatch. (1,2,3,4,5) \$7,000
- * Management of *Verticillium* in spinach. L.J. du Toit. WSCPR (\$32,797) and PSSGA via NARF (\$19,865). (1,2,3,4,5) \$52,662
- * Pacific Northwest Vegetable Extension Group. L.J. du Toit, D.A. Inglis, and C.A. Miles. \$1,926 from WSU Agriculture & Natural Resources Extension in support of team activities for 2012. (1,2,3,4,5) \$1,926
- 2011-15 * Alfred Christianson Endowed Professorship for research on vegetable seed production in western Washington. \$10,000 for each of 4 years. (1,2,3,4,5) \$40,000
- Carrot improvement for organic agriculture with added grower and consumer value. USDA Organic Agriculture Research and Education Initiative. Simon, P. (Univ. of Wisconsin), Navazio, J. (WSU Extension), Colley, M. (Organic Seed Alliance), Hoagland, L. (Purdue Univ.), and du Toit, L.J. \$136,305 for du Toit of total budget requested (4 year project). (3,5) \$136,305
- 2011 * Management of *Fusarium* wilt in radish seed crops in the Columbia Basin using limestone amendments.

L.J. du Toit. WSCPR (\$12,304) and CBVSA (\$9,504). (1,2,3,4,5)	\$21,808
* Management of <i>Verticillium</i> in spinach. L.J. du Toit. WSCPR (\$30,411) and PSSGA via NARF (\$19,608). (1,2,3,4,5)	\$50,019
* Ensuring successful transitions for women faculty in WSU's Department of Plant Pathology. L. Carris, D. Inglis, L. du Toit, and B. Schroeder. WSU ADVANCEing EXCELinSE. (2,3,5)	\$10,000
* PNW Vegetable Extension Group (PNW VEG) Operating Budget. WSU Agricultural Extension Program. D.A. Inglis, L.J. du Toit, and C.A. Miles. (4,5)	\$1,530
2010-13 * Management of <i>Rhizoctonia</i> in onion & pea crops in the Columbia Basin. WSDA SCBG. L.J. du Toit, T. Paulitz (USDA ARS), L. Porter (USDA ARS), P. Hamm (OSU), and B. Dean (River Point Farms). (1,2,3,4,5)	\$182,069
2010-14 Recurrent migrations of <i>Verticillium dahliae</i> : A stealthy and pervasive threat to California and US specialty crops. Subbarao, K., Kannan-Atallah, Z., Davis, R.M., du Toit, L.J., Koike, S.T., Mou, B., Kang, S., and Carter, C.A. USDA SCRI. \$200,000 for L.J. du Toit of total \$1,549,473 requested. (3,5)	\$200,000
ipmPIPE & innovative disease diagnostic tools for onion growers. Schwartz, H.F., vanKirk, J., + 20 cooperators from 8 states. USDA SCRI. \$164,251 for L.J. du Toit of \$885,310 for WSU from a total \$3,494,024 for all cooperators. (2,3,5)	\$164,251
2010-12 * Development of a microarray for rapid detection and differentiation of onion bulb rot pathogens. B.K. Schroeder & L.J. du Toit. 2-year grant funded by USDA Western Region IPM. (1,2,3,4,5)	\$179,253
2010-11 * Washington State University Dept. of Plant Pathology 0.25 Graduate Research Assistantship for PhD student, Maxwell Handiseni, for Fall 2010 and Spring 2011 semesters. (1,2,3,4,5)	\$11,797
* <i>Verticillium</i> wilt of spinach: Detection, biology and control. Subbarao, K., Koike, S.T., Klosterman, S., Mou, B., du Toit, L.J., & Correll, J.C. CA Leafy Greens Research Program. \$16,000 for du Toit of total budget requested. (2,3,5)	\$16,000
Evaluation of systemic induced resistance for suppression of <i>Xanthomonas hortorum</i> pv. <i>carotae</i> in carrot seed crops. USDA Pest Management Alternatives Program. B.-M. Wu (Oregon State University), K.B. Johnson (OSU), and L.J. du Toit. \$0 requested for du Toit of total \$198,355 funded. Provided intellectual input, mentoring, & assistance with planning & writing proposal for Wu, Assist. Prof. at OSU. (2,3)	\$0
2010 * Management of <i>Fusarium</i> wilt in radish seed crops in the Columbia Basin using limestone amendments and a soil bioassay. L.J. du Toit. WSCPR (\$17,057) + CBVSA (\$10,780) (1,2,3,4,5)	\$27,837
* Management of <i>Verticillium</i> in spinach seed crops. L.J. du Toit. WSCPR (\$36,956) + PSSGA via NARF (\$19,203). (1,2,3,4,5)	\$56,159
* Management of <i>Rhizoctonia</i> in onion bulb crops in the Columbia Basin. L.J. du Toit, T. Paulitz (USDA ARS), L. Porter (USDA ARS), P. Hamm (OSU), and B. Dean (River Point Farms). WSCPR (\$20,110) + PNVA (\$4,000). (1,2,3,4,5)	\$24,110
Evaluating Actigard applied through drip irrigation for controlling bacterial blight in carrot seed crops. CA Fresh Carrot Advisory Board. B.-M. Wu and K. Johnson, Oregon State University, and L.J. du Toit, WSU. (2,3)	\$18,975
2009-12 * Epidemiology and management of <i>Verticillium</i> in spinach. ASTA. du Toit, L.J., and Correll, J.C. (1,2,3,4,5)	\$90,000

- * Evaluation of seed treatments for organic vegetable production in the Pacific Northwest. WSU CSANR. \$40,000 for each of 2008-09 to 2009-10. (1,2,3,4,5) \$80,000
- * Increasing the capacity for U.S. spinach seed production by promoting soil suppression of Fusarium wilt. USDA Western Region Integrated Pest Management Program. du Toit, L.J. (1,2,3,4,5) \$99,482
- 2008-10 * Management of Fusarium wilt of spinach seed crops in western Washington. du Toit, L.J. \$8,000 for each of 3 years from Robert MacDonald Vegetable Seed Memorial Fund for partial support of a PhD student. (1,2,3,4,5) \$24,000
- 2006-10 * Alfred Christianson Endowed Professorship for research on vegetable seed production in western Washington. \$10,000 for each of 4 years. (1,2,3,4,5) \$40,000
- 2008-10 * Characterization of soil properties associated with suppression of Fusarium wilt in spinach seed crops, and development of a quantitative molecular assay for *Fusarium oxysporum* f. sp. *spinaciae*. Western SARE Graduate Student Fellow Grant in Sustainable Agriculture. (1,2,3,4,5) \$19,960
- 2009 Evaluation of conditions promoting Enterobacter rot on storage onions in Washington State. WSCPR. Schroeder, B.K., and du Toit, L.J. (1,2,3,4,5) \$6,977
- * Verticillium wilt of spinach: Detection, biology and control. Subbarao, K., Koike, S.T., Klosterman, S., Mou, B., du Toit, L.J., and Correll, J.C. California Leafy Greens Research Program. \$9,470 for du Toit of a total \$75,364 requested. (2,3,5) \$9,470
- * Assessment of limestone amendments for long-term management of Fusarium wilt in spinach seed crops, and development of a soil bioassay for *Fusarium oxysporum* f. sp. *spinaciae*. du Toit, L.J. PSSGA via NARF (\$18,663) + WSCPR (\$32,298). (1,2,3,4,5) \$50,961
- Development of a soil bioassay for Fusarium wilt in radish seed crops in the Pacific Northwest, and efficacy of limestone for suppression of radish Fusarium wilt. du Toit, L.J. CBVSA + Willamette Valley Specialty Seed Assoc. (WVSSA) via NARF (\$6,000) + WSCPR (\$17,548). (1,2,3,4,5) \$23,548
- * Development of a molecular, quantitative carrot seed assay that distinguishes DNA from viable vs. non-viable (dead) cells of *Xanthomonas hortorum* pv. *carotae*. du Toit, L.J. and Johnson, K. California Fresh Carrot Advisory Board. (1,2,3,4,5) \$40,000
- 2008 MOAs for vegetable seed crop research supported by Syngenta Crop Protection (\$7,000), BASF Corp. (\$7,500), AgriCoat LLC (\$6,500). (1,2,3,4,5) \$21,000
- Evaluation of conditions promoting Enterobacter rot on storage onions in Washington State. Schroeder, B.K., and du Toit, L.J. PNVA. (1,2,3,4,5) \$2,000
- Verticillium wilt of spinach: Detection, biology and control. Subbarao, K., Koike, S.T., Klosterman, S., Mou, B. and du Toit, L.J. Submitted to California Leafy Greens Research Program. \$5,070 of total \$71,570 requested for du Toit. (2,3,5) \$5,070
- 2007-09 * Protecting and enhancing Washington's seed industry. Principal investigators: Walsh, D. and du Toit, L.J.; Collaborators: 8 WSU extension faculty/educators. WSU Extension Issue-Focused Teams Initiative. \$3,000 pre-proposal + \$45,050 full proposal. (2,3,5) \$48,050
- 2007-08 * Use of limestone amendments, and development of a molecular assay for *Fusarium oxysporum* f. sp. *spinaciae* for management of Fusarium wilt in spinach seed crops in western Washington. du Toit, L.J. \$15,631 from PSSGA via NARF + WSCPR (\$22,107). (1,2,3,4,5) \$37,738
- Enterobacter storage rot of onion in the Pacific Northwest. Schroeder, B.K., and du Toit, L.J. \$5,000 from

	PNVA + \$9,548 from WSCPR. (1,2,3,4,5)	\$14,548
	* Effect of powdery mildew on carrot seed production in Washington. du Toit, L.J. \$6,016 from CBVSA via NARF + \$10,025 from WSCPR. (1,2,3,4,5)	\$16,041
2006-07	* Fusarium wilt of spinach seed crops in western Washington. du Toit, L.J. \$8,000 for each of 3 years from Robert MacDonald Vegetable Seed Memorial Fund for partial support of PhD student. Terminated after 1 year because student resigned. (1,2,3,4,5)	\$8,000
2006-07	* ¼-time Graduate Research Assistantship for Fall 2006 + Spring 2007 semesters for PhD student, Leigh Ann Harrison, to investigate management of Fusarium wilt in spinach seed production in western Washington. WSU Department of Plant Pathology. (1,2,3,4,5)	\$12,157
	* Seed treatments for black leg of crucifers. du Toit, L.J., Koike, S.T., and Brown, P. Western Region IR-4 Program to complete trials from 2005. (1,2,3,4,5)	\$500
2007	* <i>Cucumber mosaic virus</i> in spinach seed crops in western Washington. du Toit, L.J., Brown, P., and Rayapati, N. PSSGA via NARF (\$4,697) + seed companies (\$1,100) + WSCPR (\$10,000). (1,2,3,4,5)	\$15,797
	* Development of a molecular assay for <i>Fusarium oxysporum</i> f. sp. <i>spinaciae</i> & assessment of liming for management of Fusarium wilt in spinach seed crops in western Washington. du Toit, L.J. PSSGA via NARF (\$9,954) + WSCPR (\$14,905). (1,2,3,4,5)	\$24,859
	* Effect of powdery mildew on carrot seed production in Washington. du Toit, L.J. CBVSA via NARF (\$5,000) + WSCPR (\$10,093). (1,2,3,4,5)	\$15,093
	* Development of a molecular carrot seed assay to distinguish DNA from viable vs. dead cells of <i>Xanthomonas campestris</i> pv. <i>carotae</i> . du Toit, L.J. California Fresh Carrot Advisory Board via NARF. (1,2,3,4,5)	\$15,000
	* Evaluation of Tanos and copper bactericides for control of bacterial blight of carrot. du Toit, L.J. Central Oregon Seeds, Inc. (2,3,4,5)	\$5,000
2006	* Onion bulb and seed crop disease research. du Toit, L.J. PNVA. (1,2,3,4,5)	\$1,000
	* <i>Cucumber mosaic virus</i> in spinach seed crops in western Washington. du Toit, L.J., Brown, P., and Rayapati, N. PSSGA via NARF (\$3,000) + seed companies (\$1,000) + WSCPR (\$6,000). (1,2,3,4,5)	\$10,000
	* Development of a soil bioassay & evaluation of liming for control of Fusarium wilt in spinach seed crops in western Washington. du Toit, L.J. PSSGA via NARF (\$7,895) + WSCPR (\$10,895). (1,2,3,4,5)	\$18,790
	* Effect of powdery mildew on carrot seed production in Washington. du Toit, L.J. CBVSA via NARF (\$5,000) + WSCPR (\$9,300). (1,2,3,4,5)	\$14,300
	Evaluation of plant growth regulators for control of secondary bloom in brassica vegetable seed crops in western WA. Volker, K., Picha, G., & du Toit, L.J. PSSGA via NARF (\$4,000) + WSCPR (\$6,000). (1,2,3,4,5)	\$10,000
2005-06	* Seed treatments for black leg of crucifers. du Toit, L.J., Koike, S.T., and Brown, P. Western Region IR-4 Program (\$6,000) + BASF Corp. (\$2,000) + Syngenta Crop Protection (\$2,000). (1,2,3,4,5)	\$10,000
	* Efficacy of neonicotinyl insecticides & Actigard for management of <i>Iris yellow spot virus</i> in onion seed crops in Washington. du Toit, L.J. CBVSA (\$7,500) + WSCPR (\$11,460). (1,2,3,4,5)	\$18,960

- 2004-07 Producing organic vegetable seed – Farmer education project. Dillhon, M., Navazio, J., Herbert, N., Tipping, D., Brossy, F., du Toit, L.J., Miles, C.M., Stone, A., Myers, J., Seyedbagheri, M., Middleton, L., Maurer, T., Adam, K., and Matheson, N. One of 9 specialists assisting with field days & educational materials. USDA Western Region Sustainable Agriculture Research & Education (WSARE). (5) \$154,293
- * Organic seed treatments. Miles, C.M., Inglis, D.A., and du Toit, L.J. USDA CSANR Special Research Grant - Organic Cropping Research & Education for the Northwest. \$32,500 for each of 3 years. (2,3,4,5) \$97,500
- 2004-05 * Efficacy of Actigard, bactericides, and compost teas for control of bacterial blight in carrot seed crops. du Toit, L.J. CBVSA via NARF (\$5,000) + WSCPR (\$8,500). (1,2,3,4,5) \$13,500
- * Efficacy of neonicotinyl insecticides and Actigard for management of *Iris yellow spot virus* in onion seed crops in Washington. du Toit, L.J., & Pelter, G.Q. CBVSA via NARF (\$7,500) + WSCPR (\$9,852). (1,2,3,4,5) \$17,352
- Developing tools to manage black death of *Helleborus*. Eastwell, K.C., du Toit, L.J., Pike, K.S., and Walsh, D.B. Perennial Plant Association. (3,5) \$3,542
- * Seedborne diseases of onion. du Toit, L.J. CA Processed Onion and Garlic Research Committee of CA League of Food Processors (\$3,500) + NV Onion and Garlic Advisory Board (\$5,000). (1,2,3,4,5) \$8,500
- 2003-05 * Biology and management of leaf spot of spinach seed crops in western Washington. du Toit, L.J. PSSGA via NARF (\$7,000) + WSCPR (\$20,000). (1,2,3,4,5) \$27,000
- 2003-04 Black death of *Helleborus*: Developing pathogen detection and management strategies for the Pacific Northwest. Eastwell, K.C., du Toit, L.J., Pike, K.S., and Walsh, D.B. USDA Northwest Nursery Crops Research Center (\$26,212 for each of two years). (2,3) \$52,424
- * Efficacy of mustard biofumigants for management of weeds and Fusarium wilt in spinach seed crops in western Washington. du Toit, L.J., and Miller, T.W. PSSGA via NARF (\$6,000) + WSCPR (\$7,500). (1,2,3,4,5) \$13,500
- * Efficacy of bactericides for management of bacterial blight in carrot seed crops. du Toit, L.J., and Pelter, G.Q. CBVSA via NARF (\$5,000) + WSCPR (\$7,500). (1,2,3,4,5) \$12,500
- * Evaluation of alternative fungicide seed treatments to benomyl for management of seedborne *Phoma lingam* in Brassica vegetable crops. du Toit, L.J., and Morrison, R. Funded by vegetable seed companies through Vegetable & Flower Technical Subcomm. of American Seed Trade Assoc. (ASTA). (1,2,3,4,5) \$6,000
- * Fungicidal control of scape/umbel blight in onion seed crops in Washington. du Toit, L.J., and Pelter, G.Q. CBVSA via NARF (\$3,500) + WSCPR (\$7,500). (1,2,3,4,5) \$11,000
- * The significance and management of seedborne *Botrytis* causing neck rot of onion. du Toit, L.J., & Pelter, G.Q. PNVA (\$3,820) + WSCPR (\$5,248). (1,2,3,4,5) \$9,068
- * Vegetable Seed Pathology Extension Team. du Toit, L.J. WSU Safe Food Initiative for extension activities supporting small-seeded vegetable seed industry in Washington. (2,3,4,5) \$1,065
- * Host range of *Verticillium* on vegetable crops in western WA, and the influence of fumigation on development of *Verticillium* wilt. du Toit, L.J., & Inglis, D.A. WSCPR. (1,2,3,4,5) \$12,000
- * *Verticillium* wilt on vegetables in western WA: Cucumber & pumpkin (\$4,000 from NARF), potato (\$4,000 from WA State Potato Commission), & spinach seed crops (\$4,000 from PSSGA via NARF). du Toit, L.J., and Inglis, D.A. (1,2,3,4,5) \$12,000

- * ¼-time Research Assistantship for MS student, Pablo Hernandez, to investigate the seedborne pathogens of spinach seed crops in Washington, *Stemphylium botryosum* and *Cladosporium variabile*. Funded by WSU Department of Plant Pathology, spring & fall semesters of 2003 & 2004). (1,2,3,4,5) \$10,826
- 2002-05 * Alfred Christianson Endowed Professorship for research on vegetable seed crops in Washington. du Toit, L.J. (1,2,3,4,5) \$73,000
- 2002-04 * Robert MacDonald Vegetable Seed Memorial Fund for partial support of a graduate student to investigate seedborne aspects of leaf spot fungi in spinach seed crops in western WA. du Toit, L.J., & Glawe, D.A. (\$7,700 annually for three years). (1,2,3,4,5) \$23,100
- * Development of a molecular assay for detection & quantification of seed-borne inoculum associated with neck rot fungi of onion. du Toit, L.J., and Yohalem, D.S. WSU IMPACT Center. (1,2,3,4,5) \$35,000
- 2003 * Bacterial blight of carrot seed crops: Identification of sources of inoculum. du Toit, L.J., and Crowe, F. California Fresh Carrot Advisory Board via NARF. (1,2,3,4,5) \$10,415
- * Biology and management of leaf spot of spinach seed crops in western Washington. du Toit, L.J. PSSGA via NARF (\$6,000) + WSCPR (\$12,920). (1,2,3,4,5) \$18,920
- * Efficacy of mustard biofumigants for management of weeds and Fusarium wilt in spinach seed crops in western WA. du Toit, L.J., and Miller, T.W. PSSGA via NARF (\$9,000) + WSCPR (\$10,530). (1,2,3,4,5) \$19,530
- * Evaluation of the biology, epidemiology, & management of Botrytis neck rot/scape blight of onion seed & bulb crops. du Toit, L.J. CBVSA via NARF (\$10,500) + WSCPR (\$7,500 + 7,312). (1,2,3,4,5) \$25,312
- * Fungicidal control of Alternaria leaf spot, gray mold, and white mold on Brassica seed crops in western Washington. PSSGA via NARF. (1,2,3,4,5) \$4,000
- * Seedborne *Botrytis* of onion. Nevada Onion & Garlic Advisory Board (\$5,000) + California Onion & Garlic Research Committee (\$5,000). (1,2,3,4,5) \$10,000
- * Survey of Washington onion and onion seed crops for *Iris yellow spot virus*, a new & potentially devastating disease in the Pacific Northwest. Pappu, H.R., and du Toit, L.J. CBVSA via NARF (\$3,600) + WSCPR (\$4,500). (1,2,3,4,5) \$8,100
- 2002-03 * Bacterial blight of carrot seed crops: Identification of sources of inoculum. du Toit, L.J., and Crowe, F. CFCAB via NARF. (1,2,3,4,5) \$32,308
- * WSU Vegetable Pathology Extension Team. Inglis, D.I., and du Toit, L.J. WSU Center for Sustainable Agriculture & Natural Resources (CSANR) for Leafy Vegetable Disease Diagnosis Workshop, 24 Jul. 2003, Mount Vernon, WA. (2,3,4,5) \$1,000
- * Development of a molecular assay for detection & quantification of seed-borne inoculum associated with neck rot fungi of onion. du Toit, L.J., Yohalem, D.S., and Pelter, G.Q. PNVA. (1,2,3,4,5) \$3,713
- * Vegetable Seed Pathology Extension Team. du Toit, L.J. WSU Safe Food Initiative for extension activities supporting small-seeded vegetable seed industry in Washington. (1,2,3,4,5) \$4,000
- 2002 * Graduate Research Assistantship (0.25 FTE, spring & summer 2002) & tuition waiver for a M.S. student in Agricultural Economics to assess economic aspects of a molecular seed assay for *Botrytis* species pathogenic to onion. du Toit, L.J., and Folwell, R. WSU Agricultural Research Center. (1,2,3,4,5) \$14,700

	* Evaluation of the biology, epidemiology, & management of Botrytis neck rot/scape blight of onion bulb & seed crops. du Toit, L.J. CBVSA via NARF (\$10,500) + WSCPR (\$8,820 + \$10,099). (1,2,3,4,5)	\$25,419
2001-02	* Bacterial leaf blight of carrot seed crops: Identification of sources of inoculum. du Toit, L.J., and Crowe, F. Funded by CFCAB via NARF. (1,2,3,4,5)	\$25,810
	* Fungicidal control of Alternaria leaf spot, gray mold, and white mold on Brassica seed crops in western Washington. du Toit, L.J. PSSGA via NARF (\$3,132) + WSCPR (\$9,182). (1,2,3,4,5)	\$12,314
	* Biology & management of leaf spot of spinach seed crops in western Washington. du Toit, L.J. PSSGA via NARF (\$10,970) + WSCPR (\$10,970). (1,2,3,4,5)	\$21,940
	* Etiology of a new disease of Helleborus species in North America. Eastwell, K.C., du Toit, L.J., Pike, K.S., and Gritsenko, M.A. USDA-ARS Northwest Nursery Crop Research Center. (2,3)	\$30,000
2001	* Biology & management of Botrytis neck rot/scape blight of onion seed crops. du Toit, L.J. CBVSA via NARF. (1,2,3,4,5)	\$10,832
2000-01	* Fungicidal control of Alternaria leaf spot on cabbage seed crops. du Toit, L.J. WSCPR. (1,2,3,4,5)	\$9,182
	* Influence of environmental conditions on development of Alternaria leaf spot on cabbage seed crops. du Toit, L.J. PSSGA via NARF. (1,2,3,4,5)	\$10,832
	* Grant from WSU Center for Sustainable Agriculture and Natural Resources to attend 9 th Annual Virus Inclusion Workshop, University of Florida, Gainesville, FL, 29-31 Jan. 2001. (1,2,3,4,5)	\$500
Total grants received		<u>\$4,272,236</u>

Grants submitted & pending (1)

2017	Safeguarding production of specialty brassicas in the PNW by harnessing new technologies for integrated management of blackleg, light leaf spot, and white leaf spot in vegetable and seed crops. Submitted to USDA SCRI in Feb. 2017. Ocamb, C., Gent, D., Seavert, C., Mallory-Smith, C., West, J., King, K., Fraaije, B., and du Toit, L. \$267,515 of \$4 million for du Toit.	\$267,515
Total grants submitted and pending		<u>\$267,515</u>

Grants submitted but not funded (39)

2017 (1)	* A high-fidelity multiplex PCR assay for the detection of bacterial pathogens of onion bulbs. 2-year proposal submitted to CBORC in Nov. 2016. Frost, K., Cating, R., and du Toit, L.J. (\$67,936)	
2016 (1)	Developing genetic and molecular resources to improve spinach production and management. Submitted to USDA SCRI in Mar. 2016. Shi, A., Correll, J., Feng, C., Mou, B., Avila, C., Stein, L., Enciso, J., du Toit, L., and Koike, S. \$272,775 of \$1.8 million for du Toit.	
2015 (4)	Simon, P. (PD), Goldman, I., Van Deynze, A., Colley, M., du Toit, L.J., & Tanumihardjo, S. (Co-PIs), & collaborators. Identifying phenotypes, markers, and genes in carrot germplasm to deliver enhanced disease resistance to growers and nutritional value to consumers. Proposal submitted to USDA Specialty Crops Research Initiative in Jun. 2015 (\$3.5 million for 2015-2020, of which \$200,000 was for du Toit, L.J. and Waters, T.D. at WSU). Wasabi: Producing clean plants to support crop production. Miles, C. and du Toit, L.J. Concept Proposal submitted to the WSDA SCBG on 24 Feb. 2015 (\$241,894); Third International Research Travel Award, WSU Office of International Programs, to spend ~10 days working with T. Coutinho at the University of Pretoria on bacterial diseases of onion in South Africa (\$3,401), submitted by du Toit, L.J. du Toit, L.J., and Waters, T.W. Managing irrigation for control of onion internal dry scale and bacterial bulb rots (\$10,000 matching funding request to WSCPR).	
2014 (2)	Advancing organic seed production quality and capacity through an eOrganic course and extension resources. Submitted by Colley, M. (PD, Organic Seed Alliance), du Toit, L. J., Navazio, J., Stone, A., et al. to USDA Organic Research & Extension Initiative in May 2014 (\$185,110 for du Toit out of \$984,860)	

- requested); Breeding for resistance to powdery mildew and bacterial blight in carrot cultivars for California. du Toit, L.J., and Simon, P.W. Submitted to California Fresh Carrot Advisory Board in Jan. 2014 (\$18,887).
- 2012 (3) Graduate Student Plant Diagnosis and Extension Assistantship (GDEA) Program. du Toit, L.J., and Ward, K. Submitted on 30 October 2012 to WSU CAHNRS Extension Internal Grant Program (\$49,914); Carrot CAP: A systems approach to engage stakeholders and improve pest resistance, quality and reproductive traits in carrot. USDA Specialty Crops Research Initiative. (\$105,718 for du Toit of \$3,086,224 requested for 16 collaborators); White rust of *Echinacea*: Etiology, phylogeny, epidemiology, and management. Invited by Amway to submit a proposal for a PhD Research Assistantship for \$55,000/year x 4 years. Funding was approved but then the Vice President of Amway withdrew funding unexpectedly in Dec. 2012 (\$220,000).
- 2010 (4) OR State Dept. of Agriculture Specialty Crops Block Grant, Management of *Rhizoctonia* in onion & pea crops in the Columbia Basin (\$50,000); WA State Dept. of Agriculture Specialty Crops Block Grant, Development of a DNA macroarray for detection and differentiation of onion bulb rot pathogens, B.K. Schroeder and L.J. du Toit (\$249,785); Verticillium wilt of spinach: Detection, biology and control, L.J. du Toit & J.C. Correll, CA Leafy Greens Research Program (\$22,709); Detection of viable inoculum of the spinach downy mildew pathogen, *Peronospora farinosa* f. sp. *spinaciae*, on spinach seed, J.C. Correll, S.T. Koike, B. Bluhm, and L.J. du Toit, USDA Technical Assistance for Specialty Crops Program (\$74,000).
- 2009 (6) Influence of viral infection and plant developmental stage on the phyllosphere and rhizosphere microbial communities of leafy greens M. Ponder, G. Welbaum, S. Tolin, and L.J. du Toit. USDA Agriculture & Food Research Initiative. \$37,500 for du Toit of \$400,000 requested; Evolutionary biology and migration of *Verticillium dahliae*: Implications for California specialty crops. Subbarao, K., Klosterman, S., Koike, S.T., du Toit, L.J., Mou, B., Davis, M., and Atallah, Z. USDA Specialty Crops Research Initiative. \$100,000 of total \$659,587 requested; Onion-Legume Specialty Crops ipmPIPE. VanKirk, J., Schwartz, H.F., Langham, M., Russo, J., Douce, K., Pilcher, C., + ~20 cooperators from 6 states (incl. du Toit, L.J.). USDA Specialty Crops Research Initiative in Apr. 2009. \$86,535 of total >\$6 million requested; SpinachCAP Research and Planning Grant: A multi-disciplinary public and private effort to address spinach industry priorities. Correll, J.C., Koike, S.T., Mou, B., du Toit, L.J., Suslow, T., Villaroel-Zeballos, M.I. USDA Specialty Crops Research Initiative. \$62,820; Development of a macroarray for detection of bacterial onion bulb rot pathogens. WA State Dept. of Agric. Specialty Crop Block Grant Program. Schroeder, B.K., and du Toit, L.J. \$99,910; Enterobacter storage rot of onion in the Pacific Northwest. PNVA. Schroeder, B.K., and du Toit, L.J. \$7,000.
- 2008 (5) Development of a macroarray for detection of bacterial onion storage rot pathogens. Schroeder, B.K. and du Toit, L.J. WSU Agricultural Research Center Emerging Issues program, \$49,381; Development of a macroarray for bacterial, fungal, and yeast storage rot pathogens of onion. Schroeder, B.K., du Toit, L.J., Schwartz, H.F., Walcott, R.R., and Gitaitis, R.D. USDA Specialty Crops Research Initiative, \$694,877; Specialty Crops ipmPIPE. Melton, T., VanKirk, J., Schwartz, H.F., Langham, M., Russo, J., Douce, K., Pilcher, C., + ~20 cooperators from 6 states (incl. du Toit, L.J.). USDA Specialty Crops Research Initiative. \$86,535 of total \$3,438,326 requested; Evolutionary biology and migration of *Verticillium dahliae*: Implications for California specialty crops. Subbarao, K., Klosterman, S., Koike, S.T., du Toit, L.J., Mou, B., and Atallah, Z. USDA Specialty Crops Research Initiative. \$40,000 of total \$659,587 requested; SpinachCAP Research and Planning Grant: A multi-disciplinary public and private effort to address spinach industry priorities. Correll, J.C., Koike, S.T., Mou, B., du Toit, L.J., Suslow, T., Villaroel-Zeballos, M.I. USDA Specialty Crops Research Initiative, \$62,820.
- 2007 (2) Onion thrips and *Iris yellow spot virus*. USDA Pest Information Platform for Extension and Education (PIPE), H.F. Schwartz & collaborators from 7 states (\$69,300 of total \$299,250 requested); \$3,000 pre-proposal to WSU Extension Issue-Focused Teams initiative to support PNW Vegetable Extension Group (PNW VEG).
- 2006 (4) \$118,500 request to USDA Western Region IPM, \$18,986 request to USDA Western SARE, \$576,832 request to USDA Crops at Risk program, ~\$20,000 for ¼-time PhD Graduate Assistantship requested from WSU Agricultural Research Center.
- 2005 (2) Total of \$236,808 requested from USDA Western Region IPM, & USDA-ARS Northwest Nursery Crops Research Center.
- 2004 (2) Total of \$2,392,376 requested from WSU Safe Food Initiative, USDA Risk Avoidance & Mitigation Program.
- 2003 (3) Total of \$119,832 from USDA Northwest Nursery Crops Research Center, Horticulture Research Institute of

American Nursery and Landscape Assoc., & USDA Leafy Vegetable Crops Germplasm Committee.
 2002 (3) Total of \$617,271 requested from USDA Technical Assistance for Specialty Crops, USDA Western Region IPM Competitive Grants Program, & WSU IMPACT Center.

GIFTS

- 2016 Donations for vegetable seed pathology research and extension: Bejo Seeds, Inc. (\$12,500); Gowan Seed Co. LLC (\$800), J.C. Watson Packing Co. (\$1,068 for onion grower workshop in Jan. 2016); Simplot, Ontario, OR (\$652 for onion grower workshop in Mar. 2016); Idaho Onion Growers' Assoc. (\$461 to speak at annual meeting); CA Seed Assoc. (\$224 to speak at annual meeting); Nevada Fresh Pak, Yerington, NV (\$3,500 donation from David Peri, onion grower); Gowan Seed Co. (\$750) \$19,955
- 2015 DuPont Crop Protection for onion research trials (\$3,211); Bejo Seeds, Inc. donation of flight to central OR for carrot bacterial blight meeting (\$399) \$3,610
- 2014 Central Oregon Seeds, Inc. for carrot seed crop research (\$1,087); Rijk Zwaan Seed Co. for spinach seed crop research (\$5,000); Bayer CropScience for vegetable pathology research (\$13,000); Schafer Ag Services (\$1,000) \$20,087
- 2013 Central Oregon Seeds, Inc. for research on carrot seed crop diseases (\$1,000+\$1,129); donation from Trout Lake Farms, Ephrata, WA for research on 'White rust of *Echinacea*: Etiology, phylogeny, epidemiology, and management (\$5,000); donation from DuPont for onion *Rhizoctonia* research (\$3,000); donation from Eurofins STA Labs for travel expenses to speak at CA Leafy Greens Research Board Annual Meeting in Harris Ranch, CA on 19 March 2013 (\$240 hotel + \$218 airfare = \$458 donation); donation from Syngenta Crop Protection for radish seed treatment evaluations (\$2,250); donation from Bayer for field research on onion and carrot soilborne diseases (\$13,000); donation from Precision Seed Production for carrot research (\$804); donation from Bejo Seeds, Inc. for support of MS student, Eric Christianson, on carrot bacterial blight project. \$36,641
- 2012 * Donation from Central Oregon Seeds, Inc. for research on carrot seed crop diseases (\$2,450); in-kind donations from seed companies for 2012 spinach *Verticillium* research project (\$1,000); donation from Holaday Seeds, Inc. for spinach research (\$710); donation from Klein Karoo Seed Production for onion *Iris yellow spot virus* research in South Africa (ZAR15,000 = ~US\$2,000); donation from Syngenta Crop Protection, Inc. for spinach *Verticillium* research (\$7,500); donation from Bejo Seeds, Inc. for support of MS student, Eric Christianson, working on carrot bacterial blight (\$10,000); donation from Seminis Vegetable Seeds for research on spinach Fusarium and Verticillium wilts (\$10,000 + \$15,000); donation from Dow AgroSciences for onion *Rhizoctonia* project (\$10,000). \$58,660
- 2011 * Donations from seed growers, seed companies, and agricultural supply companies of in-kind support towards 2011 research funded by WSCPR, PSSGA & CBVSA (\$4,000); donation from Bejo Seeds to cover my expenses for attending the 2011 APS meeting, 6-10 Aug. 2011, Honolulu, HI (\$2,098); donation from Rijk Zwaan Seed Co. to cover my flight expense to Amsterdam, Netherlands, to speak at 2011 Internat. Spinach Conference and at Rijk Zwaan headquarters, Delft, Netherlands (see **Invited Presentations** above) (\$800); donation from organizers of 2011 Internat. Carrot Conference to speak at that conference, 30 Nov. – 2 Dec. 2011, Misty Hills, Johannesburg, South Africa (\$2,000). \$8,898
- 2010 * Donations from seed growers, seed companies, and chemical companies of in-kind support towards 2010 research funded by WSCPR, PSSGA & CBVSA (\$3,000). Cash donations from AgriCoat LLC (\$2,000), Seminis Vegetable Seeds, Inc. (\$3,000), Vikima USA (\$2,500), Pop Vriend Seeds B.V. (\$5,000), Rijk Zwaan (\$5,000), & Syngenta Crop Protection (\$3,000) for spinach seed research. \$23,500
- Donations from River Point Farms (\$5,000), Dow AgroSciences (\$3,000), & BASF Corp. (\$3,000) to match WSCPR funding for 'Management of *Rhizoctonia* in onion bulb crops in the Columbia Basin'. \$11,000

2009 * Donations from seed growers, seed companies, and chemical companies of in-kind support towards 2009
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- research funded by PSSGA, CBVSA, and WSCP (R) (\$3,500); BASF Corp. donation towards onion seed treatment research (\$3,000); Bejo Zaden for support of research on Fusarium wilt diseases and bacterial blight of carrot (\$20,000); Central Oregon Seeds, Inc. donation towards carrot steckling dip treatment trial for management of bacterial blight (\$8,911); Sakata Vegetable Seeds NA and Alf Christianson Seed Co. donation towards a molecular carrot seed assay workshop (\$2,000); Seminis Vegetable Seeds donation to carrot and spinach research projects on seedborne pathogens (\$17,500); Syngenta Crop Protection for research on seed treatments for seedborne pathogens (\$4,000). \$58,911
- 2008 * In-kind donations for two research projects: Management of Fusarium wilt in spinach seed crops (\$3,000); Carrot powdery mildew (\$2,200). \$5,200
- * Donation for purchase of equipment for the new Core Molecular Laboratory at the WSU Mount Vernon NWREC. Pop Vriend Seeds B.V., Holland (\$5,000), Schafer Ag Services, Mount Vernon, WA (\$2,000), Holaday Seeds, Salinas, CA (\$1,000). \$7,000
- 2007 * Evaluation of Actigard for control of *Iris yellow spot virus* and bacterial diseases in onion bulb crops in the Columbia Basin (\$8,000), Syngenta Crop Protection; Evaluation of FarMore seed treatment technology for control of seedborne *Botrytis allii* on onion (\$4,000), Syngenta Crop Protection; Carrot bacterial blight ManKocide trials (\$1,000), DuPont Crop Protection; general vegetable seed pathology research/extension support (\$1,000 from Schafer Ag Services, \$2,000 from PROfessional Agronomic Consulting, \$1,500 from AgriCoat LLC, \$100 from Organic Seed Alliance). \$17,600
- 2006 * Donations of seed/stecklings, fungicides, labor, field space, sprayers, & plot maintenance for trials in vegetable seed crops. Alf Christianson Seed Co., Bejo Seeds, Harris Moran, Kapa Seed Services, Klaustermeyer Farms, Organic Seed Alliance, Precision Seed Production, Schafer Ag Services, Seminis, Silverado Ranch Supply, Skagit Seed Services, Sorensen Seed Co., Syngenta, & Wilbur Ellis. \$9,809
- 2005 * Donations of seed, seedlings, stecklings, fungicides, labor, field space, sprayers and brewers, & field plot maintenance for trials on diseases of small-seeded vegetable seed crops in Washington. Alf Christianson Seed Co., Bejo Seeds, Harris Moran, Kapa Seed Services, Precision Seed Production, Schafer Ag Services, Seminis Seeds, Skagit Seed Services, Sorensen Seed Co., Syngenta Crop Protection, & Wilbur Ellis. \$13,100
- 2004-05 * Donations of seed, seedlings, stecklings, fungicides, labor, field space, sprayers and brewers, & field plot maintenance for trials on diseases of seed crops. Alf Christianson Seed Co., BASF, Bejo Seeds, Griffin., Harris Moran, Kapa Seed Services, Precision Seed Production, Schafer Ag Services, Seminis Vegetable Seeds, Skagit Seed Services, Sorensen Seed Co., Syngenta Crop Protection, UAP, Wilbur Ellis. \$6,350
- 2004 * Donations of seed, seedlings, stecklings, fungicides, labor, field plot maintenance, and finances for research trials on diseases of small-seeded vegetable seed crops in Washington. Alf Christianson Seed Co., Bejo Seeds, Griffin Corp., Harris Moran, Kapa Seed Services, Precision Seed Production, Schafer Ag Services, Seminis Seeds, Skagit Seed Services, Sorensen Seed Co., Syngenta Crop Protection, UAP, and Wilbur Ellis. Payment for spinach seed harvested from 2003 leaf spot trials. Sorensen Seed Co. (\$1,940). \$6,190
- 2003-04 * Pop Vriend Seeds B.V. (Holland, \$1,350) and L. Daehnfeldt A/S (Denmark, \$125) for support of research on leaf spot of spinach seed crops. \$1,475
- 2003 * Donations of seed, seedlings, fertilizer, fungicides, labor, & field plot maintenance for research trials on diseases of vegetable seed crops. Alf Christianson Seed Co., Bejo Seeds, Harris Moran, Hedlin Farms, Kapa Seed Services, Precision Seed Production, Schafer Ag Services, Seminis Seeds, Skagit Seed Services, Syngenta Crop Protection, UAP, & Wilbur Ellis. \$2,750
- * Batch Lab Seed Treater from Gustafson. \$1,975
- * Gowan (\$2,000) and BASF Corp. (\$1,000) for fungicide evaluations for management of diseases of small-seeded vegetable seed crops. \$3,000

	* Puget Sound Seed Growers' Assoc. for housing for MS student, Hernandez-Perez, summer 2003.	\$1,500
2002	* Donations of seed, seedlings, fertilizer, fungicides, labor, and field plot maintenance for various research trials on diseases of small-seeded vegetable seed crops in Washington. Alf Christianson Seed Co., Bejo Seeds, Harris Moran, Hedlin Farms, Kapa Seed Services, Precision Seed Production, Schafer Ag Services, Seminis Seeds, Skagit Seed Services, Syngenta Crop Protection, UAP, & Wilbur Ellis. Field efficacy trials of BASF fungicides on onion & Brassica seed crops for the IR-4 Fungicide program (\$6,000).	\$10,000
2001	* Biology & management of leaf spot of spinach seed crops. In-kind donations of seed, labor, use of equipment, and field plot maintenance from Alf Christianson Seed Company for field trials.	\$2,500
2000	* Donation of plants, labor, machinery, row cover, supplies, equipment, & travel expenses by Alf Christianson Seed Co., Syngenta Seeds, & Skagit Seed Services for research & to attend conferences.	\$4,467
	Total gifts received	<u>\$339,307</u>
	Total grants and gifts received	<u>\$4,487,623</u>