

*CURRICULUM VITAE*

**Lindsey Jane du Toit**

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

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

B.Sc. Honors, 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.

Since Sep. 2009 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 (58 total)

- 201\_ (3) \* Gatch, E.W., and du Toit, L.J. 201\_. A soil bioassay for predicting the risk of spinach Fusarium wilt. Plant Disease: *submitted 6 Aug. 2014. Accepted 17 Sep. pending minor revisions. PDIS-08-14-0804-RE. Revised and resubmitted 7 Oct. 2014. Accepted 7 Oct. 2014.* (1,2,3,4,5,6)
- \* Sharma-Poudyal, D., Paulitz, T.C., and du Toit, L.J. 201\_. Stunted patches in onion bulb crops in Oregon and Washington: Etiology and yield loss. Plant Disease: *submitted 1 May 2014. PDIS-05-14-0441-RE. Accepted 21 Jun. pending revisions. Resubmitted 18 Sep.* (1,2,3,4,5,6)
- \* Sharma-Poudyal, D., Paulitz, T.C., Porter, L.D., and du Toit, L.J. 201\_. Characterization and pathogenicity of *Rhizoctonia* and *Rhizoctonia*-like species from pea crops in the Columbia Basin of Oregon and Washington. Plant Disease: *submitted 6 Aug 2014. Accepted 5 Sep. pending revisions. PDIS-08-14-0803-RE.* (1,2,3,4,5,6)

- 2014 (4) \* 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)
- 2013 (4) \* Iglesias-Garcia, A.M., Villarreal-Zaballos, 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)
- \* Villarreal-Zaballos, 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 byssoides*, 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 spiropasmal 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 (3)

- 2014 Bull, C.T., Ortiz-Lytle, M.C., Ibarra, A.G., du Toit, L.J., and Reynolds, G. 201\_. First report of bacterial blight of crucifers caused by *Pseudomonas cannabina* pv. *alisalensis* in Minnesota on arugula (*Eruca vesicaria* subsp. *sativa*). Plant Disease: *submitted on 8 Oct. 2014*. PDIS-10-14-1020-PDN.
- 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., Wiriyaitsomboon, P., and Wohleb, C. 201\_. Onion ipmPIPE : A coordinated effort to improve the management of onion thrips and IYSV for onion growers and their industry. Plant Health Progress: *submitted 16 Jul. 2014*. PHP-FE-14-0026. (3,4,6)
- 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. 201\_. The CIOA (Carrot Improvement for Organic Agriculture) Project : Location, cropping system, and genetic background influence carrot performance, including top height and flavor. Acta Horticulturae: *submitted Sep. 2014*. (3,6)

#### Manuscripts in preparation (9)

- \* Alcalá, A.C., Paulitz, T.C., Schroeder, K.L., Porter, L.D., and du Toit, L.J. 201\_. *Pythium* species associated with damping-off of pea in certified organic fields in the Columbia Basin of central Washington. Plant Disease: *in preparation*. (1,2,3,4,5,6)
- \* 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)
- Bull, C.T., Ortiz-Lytle, M., Ibarra, A., du Toit, L.J., and Reynolds, G. 201\_. First report of bacterial blight of crucifers by *Pseudomonas cannabina* pv. *alisalensis* in Minnesota on arugula (*Eruca vesicaria*

- subsp. *sativa*). Plant Disease: *in preparation*. (1,6)
- \* 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)
  - \* du Toit, L.J., Takeyasu, J., and Putnam, M.L. 201\_. Verticillium wilt in radish seed production. Plant Disease: *in preparation*. (1,2,3,4,5,6)
  - \* Christianson, C.E., Jones, S.S., and du Toit, L.J. 201\_. Screening carrot germplasm for resistance to *Xanthomonas hortorum* pv. *carotae*. Plant Disease: *in internal review*. (1,2,3,4,5,6)
  - \* Gatch, E.W., and du Toit, L.J. 201\_. Limestone-mediated suppression of Fusarium wilt in spinach seed crops. Plant Disease: *in preparation*. (1,2,3,4,5,6)
  - \* Schroeder, B.K., Humann, J.L., Dossey, S.M., Bates, A.A., Kennedy, A.C., and du Toit, L.J. 201\_. Association of *Enterobacter cloacae* and other bacteria with onion bulb rot in the Columbia Basin of Washington and Oregon, USA. Plant Pathology: *Submitted 4 Jan. 2012, accepted 27 Feb. 2012 pending revisions, PP-12-008. Pulled 26 Apr. 2012 to revise and resubmit*. (1,2,5,6)
  - \* Sharma-Poudyal, D., Paulitz, T.C., and du Toit, L.J. 201\_. Evaluation of onion genotypes for resistance to stunting caused by *Rhizoctonia solani* AG 8. HortScience: *in internal review*. (1,2,3,4,5,6)

**Professional articles, non-refereed (33)**

- 2014 (6) \* du Toit, L.J., Derie, M.L., and Waters, T.D. 2014. 2013 Carrot cavity spot Serenade Soil trial. Research report submitted to Dean Christie, Bayer CropScience, in Jan. 2014. 6 pp.
- \* du Toit, L.J., Derie, M.L., and Waters, T.D. 2014. 2013 Onion pink root Serenade Soil efficacy trial in Pasco, Washington. Research report submitted to Dean Christie, Bayer CropScience, in Feb. 2014. 5 pp.
  - \* du Toit, L.J., Sharma-Poudyal, D., Knerr, J., and Paulitz, T. 2014. Mycorrhizae in onion bulb production in the Columbia Basin. Pp. 7-8 in: 2014 WSU Onion Cultivar Demonstration & Field Day handouts. Washington State University, Pullman, WA.
  - \* du Toit, L.J., Sharma-Poudyal, D., Paulitz, T., Hamm, P., and Eggers, J. 2014. Effect of deep vs. shallow tillage on onion stunting caused by *Rhizoctonia solani* AG 8 and onion bulb yield. Pp. 9-10 in: 2014 WSU Onion Cultivar Demonstration & Field Day handouts. Washington State University, Pullman, WA.
  - \* Ocamp, C.M., and du Toit, L.J. 2014. Black leg in Brassicaceae crops and wild crucifers: 2014 epidemic in the Willamette Valley of Oregon. 2 pp. [http://mtvernon.wsu.edu/path\\_team/brassicaceae.htm#blackleg](http://mtvernon.wsu.edu/path_team/brassicaceae.htm#blackleg) and in Whatcom Ag Monthly 3:1-3.
  - \* Pappu, H.R., Waters, T., Wohleb, C., Schroeder, B.K., and du Toit, L.J. 2014. W2008 Accomplishments for 2013 by Washington State participants. March 2013. 6 pp.
- 2013 (4) \* du Toit, L.J., Poudyal, D.S., Paulitz, T., Porter, L., Hamm, P., and Eggers, J. 2013. Rhizoctonia seedling blight in onion crops in the Columbia Basin. Pp. 10-11 in: 2013 WSU Onion Cultivar Demonstration and Field Day handouts. Washington State University, Pullman, WA.
- \* du Toit, L.J., Poudyal, D.S., Paulitz, T., and Linderman, R. 2013. Preliminary survey for mycorrhizae in organic and conventional onion bulb crops in the Columbia Basin. Pp. 12-13 in: 2013 WSU Onion Cultivar Demonstration and Field Day handouts. Washington State University, Pullman, WA.
- Schwartz, H.F., du Toit, L.J., Reeder, M., Uchanski, M., Ehn, R., Groves, R., Gourd, T., Nissen, S., Nischwitz, C., Morrice, J., and numerous other contributors. 2013. Pest Management Strategic Plan for Dry Bulb Storage Onions in the United States. Western Region Integrated Pest Management Center, USDA CSREES. (6)
- Schwartz, H.F., Randle, B., Hoepting, C., Simerly, R., du Toit, L.J., and Cramer, C. 2013. National Onion Research Assessment: U.S. Onion Research & Extension Assessment Proposal. National Onion Association, Greeley, CO. 8 pp.
- 2012 (5) \* du Toit, L.J. Summary of *Verticillium* Spinach-Lettuce Field Research Trials: 2010-2011. Report presented to California Spinach Research Board, 17 Feb. 2012. 1 page. (1,2,3,4,5,6)
- \* du Toit, L.J., Poudyal, D.S., Paulitz, T., Porter, L., Hamm, P., and Eggers, J. 2012. Rhizoctonia seedling blight of onion crops in the Columbia Basin. Pp. 8-9 in: 2012 WSU Onion Cultivar Demonstration and Field Day handouts. Washington State University, Pullman, WA.
  - \* Carris, L., du Toit, L.J., Inglis, D.A., and Schroeder, B.K. 2012. Frequently asked questions and answers on professional leave (sabbatical). 9 pages.

- <http://provost.wsu.edu/Frequently%20Asked%20Questions%20and%20Answers%20on%20Professional%20Leave.pdf> (2,3,4,5,6)
- \* Carris, L. Inglis, D.A., du Toit, L.J., and Schroeder, B.K. 2012. Ensuring successful transitions for women faculty in Washington State University's Department of Plant Pathology. ADVANCEing EXCELinSE Report. 1 Mar. 2012. 4 pages. (2,3,4,5,6)
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- 2013 (5) \* Alcalá, A.C., du Toit, L.J., Derie, M.L., Holmes, B., Coffman, G., Gatch, E.W., and Porter, L.D. 2013. Evaluation of priming and Nordox seed treatment for controlling damping-off in organic pea crops in central Washington, 2012. *Plant Disease Management Reports* 7:ST001. (1,2,3,4,5,6)

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- 2011 (3) \* du Toit, L.J., Derie, M.L., Gatch, E.W., Alcalá, A.C., Reed, K., and Holmes, B.J. 2011. Effect of agricultural limestone amendment on Fusarium wilt in a radish seed crop, 2010. Plant Disease Management Reports 5:ST001. (1,2,3,4,5,6)
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- \* du Toit, L.J., Miller, T.W., Derie, M.L., Maupin, B.G., Peterson, R.K., and Libbey, C. 2004. Evaluation of mustard cover/biofumigant crops for management of *Fusarium* wilt in spinach seed crops, 2002-2003. *Biological & Cultural Tests* 19:V004. (1,2,3,4,5,6)
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- 2013 (4) \* Benedict, C., and du Toit, L.J. 2013. Managing clubroot on crucifer crops. *Whatcom Ag Monthly* 2:10-12. (1,2,3,4,5,6)
- \* Bush, M.R., Wohleb, C.H., Rondon, S.I., Waters, T.D., Llewellyn, D.A., and du Toit, L.J. 2013. Blister beetles: Pest or beneficial predator? <http://cru.cahe.wsu.edu/CEPublications/FS113E/FS113E.pdf> (5,6)
- \* Inglis, D.A., du Toit, L.J., and Miller, T.W. 2013. Production of Brassica Seed Crops in Washington State: A Case Study on the Complexities of Coexistence. Washington State University Extension Manual EM062E. <https://pubs.wsu.edu/ItemDetail.aspx?ProductID=15578&SeriesCode=&CategoryID=&Keyword=EM062E> (2,3,4,5,6)
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- 2012 (1) \* Ward, K.F., and du Toit, L.J. 2012. Buckwheat – *Beet curly top virus*. Page 4B-44 in: 2012 Pacific Northwest Disease Management Handbook, J.W. Pscheidt and C.M. Ocamb, editors. A Pacific Northwest Extension Publication, Oregon State University, Washington State University, University of Idaho. <http://pnwhandbooks.org/plantdisease/host-disease-descriptions/buckwheat-fagopyrum-esculentum-f-tataricum-curly-top> (1,2,3,4,5,6)
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- 2010 (1) Pacific Northwest Vegetable Extension Group (PNW VEG). 2009. Physiological leaf roll of tomato. PNW Extension Bulletin No. 616, Washington State University, Pullman, WA. (6)
- 2009 (1) \* du Toit, L.J., and Gatch, E.W. 2009. Disease management in organic seed production. In: Organic Seed Resource Guide, M.C. Colley, A. Stone, L. Brewer, and B. Baker, editors. eXtension and Washington State University Extension, <http://www.extension.org/article/18660> (5,6)
- 2008 (7) \* du Toit, L.J. 2008. Revised or prepared new sections for 2008 Pacific Northwest Plant Disease Management Handbook on the following spinach diseases: Downy mildew, *Fusarium* wilt, Leaf spot, Spinach blight (*Cucumber mosaic virus*), *Stemphylium* leaf spot, *Verticillium* wilt, and Yellows (*Beet western yellows virus*). Oregon State University, Washington State University, and University of Idaho. (1,2,3,4,5,6)
- 2006 (1) \* du Toit, L.J., and Trent, M. 2006. 2005 Columbia Basin Onion Storage Demonstration Results. WSU Grant/Adams County Extension, Ephrata, WA. <http://grant-adams.wsu.edu/agriculture/Vegetable%20Page/2005onion%20storage%20results.pdf> (1,2,3,4,5,6)
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- 1995 (1) Pataky, J.K., du Toit, L.J., Kerns, M.R., and Gantz, J.W. 1995. Sweet corn hybrid disease nursery 1995. Midwestern Vegetable Variety Trial Report for 1995. Purdue Ag. Exp. Sta. Bull. No. 718. (3,6)
- 1993 (1) Kirby, H.W., Edwards, D., and du Toit, L.J. 1993. Chapter 6. Plant Disease Management for Field Crops, pp. 119-137, In: 1993 Illinois Agricultural Pest Control Handbook. University of Illinois at Urbana-Champaign, College of Agriculture Cooperative Extension Service in cooperation with the Illinois Natural History Survey. (5,6)

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- \* du Toit, L.J., and Benedict, C. 201\_. Clubroot of cabbage and other crucifers. **Submitted to WSU FastTrack 23 Jul. 2014, accepted pending revisions on 1 Oct. 2014. 2014-1194.**
- \* Reitz, S., Schroeder, B., and du Toit, L.J. 201\_. Meeting challenges facing Pacific Northwest onion growers. *Onion World* : **submitted 31 July 2014.** (1,2,3,4,5,6)

#### **Proceedings (46 – see also Invited presentations below and Abstracts above)**

- 2012 (1) \* du Toit, L.J., Poudyal, D.S., Paulitz, T., Porter, L., Eggers, J., and Hamm, P. 2012. 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>
- 2009 (1) \* du Toit, L.J., Temple, T., Derie, M.L., and Johnson, K. 2009. Development of a molecular carrot seed assay that distinguishes DNA from viable vs. dead cells of *Xanthomonas campestris* pv. *carotae*. Pages 5-20, In: 2008 Annual Report of the California Fresh Carrot Advisory Board, Dinuba, CA.
- 2008 (4) \* du Toit, L.J., and Derie, M.L. 2008. Development of a molecular carrot seed assay that distinguishes DNA from viable vs. dead cells of *Xanthomonas campestris* pv. *carotae*. Pages 25-33, In: 2007 Annual Report of the California Fresh Carrot Advisory Board, Dinuba, CA.
- \* du Toit, L.J. 2008. Infection of seed and transmission of seed borne plant pathogens. Page 44, In: Proceedings of the 5<sup>th</sup> Organic Seed Growers' Conference, 14-15 Feb. 2008, Salem, OR.
- \* du Toit, L.J. 2008. Soil amendment with limestone for management of Fusarium wilt in spinach seed production in western Washington. Pages 24-29, In: Proceedings of the 98<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 9-10 Jan. 2008, Everett, WA.
- \* du Toit, L.J. 2008. *Cucumber mosaic virus* in spinach seed crops in the Pacific Northwest. Pages 30-34, In: Proceedings of the 98<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 9-10



- Jan. 2008, Everett, WA.
- 2007 (3) \* du Toit, L.J. 2007. Efficacy of seed treatments for control of *Stemphylium botryosum* in spinach. Pages 30-32, In: Proceedings of the 97<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 3-4 Jan. 2007, SeaTac, WA.
- \* du Toit, L.J. 2007. Soil amendment with limestone for management of Fusarium wilt in spinach seed production in western Washington. Pages 33-38, In: Proceedings of the 97<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 3-4 Jan. 2007, SeaTac, WA.
- \* du Toit, L.J., Brown, P., and Rayapati, N. 2007. *Cucumber mosaic virus* in spinach seed crops in the Pacific Northwest. Pages 42-44, In: Proceedings of the 97<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 3-4 Jan. 2007, SeaTac, WA.
- 2006 (5) \* du Toit, L.J., Derie, M.L., and Brissey, L.M. 2006. Efficacy of seed treatments for control of *Stemphylium botryosum* in spinach. Pages 26-28, In: Proceedings of the 2006 International Spinach Conference, 13-14 Jul. 2006, La Conner, WA.
- \* du Toit, L.J., and Miller, T.W. 2006. Efficacy of mustard cover/biofumigant crops for management of weeds and Fusarium wilt in spinach seed production. Pages 22-25, In: Proceedings of the 2006 International Spinach Conference, 13-14 Jul. 2006, La Conner, WA.
- \* Mou, B., Koike, S.T., and du Toit, L.J. 2006. Screening for resistance to *Stemphylium* leaf spot of spinach. Pages 29-30, In: Proceedings of the 2006 International Spinach Conference, 13-14 Jul. 2006, La Conner, WA.
- \* du Toit, L.J. 2006. Disease management in vegetable seed crops: 2005 research report. Pages 17-22, In: Proceedings of the 96<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 4-5 Jan. 2006, SeaTac, WA.
- \* du Toit, L.J. 2006. Seedborne diseases: An overview. Pages 37-47, In: Proceedings of the Organic Seed Growers' Conference, 11-12 Jan. 2006, Troutdale, OR.  
<http://www.seedalliance.org/uploads/pdf/ProceedingsPapers.pdf>
- 2005 (4) \* du Toit, L.J., Derie, M.L., and Hernandez-Perez, P. 2005. Leaf spot of spinach: 3<sup>rd</sup> year report. Pages 39-48, In: Proceedings of the 95<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 11-13 Jan. 2005, SeaTac, WA.
- \* du Toit, L.J., Derie, M.L., and Morrison, R.H. 2005. Seed treatments for control of black leg of Brassicas. Pages 57-58, In: Proceedings of the 95<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 11-13 Jan. 2005, SeaTac, WA.
- \* du Toit, L.J., Inglis, D.A., Derie, M.L., and Gunderson, B. 2005. Verticillium wilt in spinach seed production. Pages 33-37, In: Proceedings of the 95<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 11-13 Jan. 2005, SeaTac, WA.
- \* du Toit, L.J., Miller, T.W., Derie, M.L., Libbey, C., Maupin, B., and Peterson, R. 2005. Efficacy of mustard cover/biofumigant crops for control of weeds and Fusarium wilt in spinach seed production: 2<sup>nd</sup> year report. Pages 27-32, In: Proceedings of the 95<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 11-13 Jan. 2005, SeaTac, WA.
- 2004 (7) \* du Toit, L.J. 2004. Verticillium wilt in spinach seed crops. Pages 31-36, In: Proceedings of the 94<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 7-9 Jan. 2004, SeaTac, WA.
- \* du Toit, L.J., and Derie, M.L. 2004. Control of *Alternaria* leaf/pod spot and white mold in Brassica seed crops: Final Research Report. Pages 17-19, In: Proceedings of the 94<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 7-9 Jan. 2004, SeaTac, WA.
- \* du Toit, L.J., Derie, M.L., and Hernandez-Perez, P. 2004. Biology and management of leaf spot of spinach seed crops in western Washington. Pages 23-26, In: Proceedings of the 94<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 7-9 Jan. 2004, SeaTac, WA.
- \* du Toit, L.J., Miller, T.W., Derie, M.L., Libbey, C.R., Maupin, B., and Peterson, R.K. 2004. Evaluation of mustard cover crops for management of weeds and Fusarium wilt in spinach seed crops in western Washington. Pages 26-29, In: Proceedings of the 94<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 7-9 Jan. 2004, SeaTac, WA.
- \* du Toit, L.J., Derie, M.L., Chilvers, M.I., and Pelter, G.Q. 2004. Evaluation of the significance and management of seedborne *Botrytis* spp. associated with neck rot of onion: Progress report. Pages 21-29, In: Proceedings of the 18<sup>th</sup> Annual Conference & Trade Show of the Pacific Northwest Vegetable

- Association, 17-18 Nov. 2004, Pasco, WA.
- \* du Toit, L.J., Derie, M.L., and Pelter, G.Q. 2004. Efficacy of fungicide seed treatments and foliar applications for management of *Botrytis aclada* in onion bulb and seed crops in Washington. Pages 93 & 185-194, In: Proceedings of the 2004 National Allium Research Conference, 9-10 Dec. 2004, Grand Junction, CO.
  - \* du Toit, L.J., Pelter, G.Q., and Pappu, H.R. 2004. IYSV challenges to the onion seed industry in Washington. Pages 103 & 213-217, In: Proceedings of the 2004 National Allium Research Conference, 9-10 Dec. 2004, Grand Junction, CO.
- 2003 (5) \* du Toit, L.J. 2003. Verticillium wilt of spinach. Pages 20-25, In: Proceedings of the National Spinach Conference, 20-21 Nov. 2003, Fayetteville, AR.
- \* du Toit, L.J., and Derie, M.L. 2003. Some epidemiological aspects of Stemphylium leaf spot and Cladosporium leaf spot in spinach seed production. Pages 26-28, In: Proceedings of the National Spinach Conference, 20-21 Nov. 2003, Fayetteville, AR.
  - \* du Toit, L.J., and Derie, M.L. 2003. Diseases of Brassica seed crops: 2001/02 fungicide efficacy trials. Pages 54-60, In: Proceedings of the 93<sup>rd</sup> Annual Convention of the Western Washington Horticulture Association, 9-11 Jan. 2003, SeaTac, WA.
  - \* du Toit, L.J., and Derie, M.L. 2003. Leaf spot of spinach: Research results for 2002. Pages 61-64, In: Proceedings of the 93<sup>rd</sup> Annual Convention of the Western Washington Horticulture Association, 9-11 Jan. 2003, SeaTac, WA.
  - \* du Toit, L.J., and Derie, M.L. 2003. Stemphylium leaf spot of spinach seed crops. Page 169, In: Proceedings of the 2003 Eucarpia Leafy Vegetables Conference, 19-21 Mar. 2003, Noordwijkerhout, The Netherlands.
- 2002 (7) \* Costanigro, M, du Toit, L.J., Folwell, R.J., and Pelter, G.Q. 2002. Economic implications of a molecular seed assay for detection of seedborne *Botrytis* spp. of onion. Pages 127-130, In: Proceedings of the 2002 National Allium Research Conference, 12-14 Dec. 2002, Pasco, WA.
- \* du Toit, L.J., Derie, M.L., and Pelter, G.Q. 2002. *Botrytis* spp. associated with onion seed crops in Washington State. Pages 47-56, In: Proceedings of the 2002 National Allium Research Conference, 12-14 Dec. 2002, Pasco, WA.
  - \* du Toit, L.J., and Crowe, F. 2002. Progress report on bacterial blight of carrot seed crops in the Pacific Northwest: Identification of sources of inoculum. Pages 29-37, In: 2001 Annual Report of the California Fresh Carrot Advisory Board, Dinuba, CA.
  - \* du Toit, L.J., and Derie, M.L. 2002. Diseases of Brassica seed crops: 2001 research report. Pages 2-3, In: Proceedings of the 91<sup>st</sup> Annual Meeting of the Western Washington Horticulture Association, 8-10 Jan. 2002, SeaTac, WA.
  - \* du Toit, L.J., and Derie, M.L. 2002. Leaf spot of spinach seed crops: 2001 research report. Page 1, In: Proceedings of the 91<sup>st</sup> Annual Meeting of the Western Washington Horticulture Association, 8-10 Jan. 2002, SeaTac, WA.
  - \* du Toit, L.J., Derie, M.L., Crowe, F., Bafus, R., and Pelter, G.Q. 2002. Bacterial blight of seed carrots. In: Proceedings of the 2002 Annual Convention of the Pacific Northwest Vegetable Association, 21-22 Nov. 2002, Pasco, WA.
  - \* du Toit, L.J., Derie, M.L., and Pelter, G.Q. 2002. Gray mold and onion seed ... A research update. In: Proceedings of the 2002 Annual Convention of the Pacific Northwest Vegetable Association, 21-22 Nov. 2002, Pasco, WA.
- 2001 (5) \* du Toit, L.J. 2001. Botrytis gray mold ... Effects on seed onions. Pages 109-112, In: Proceedings of the Pacific Northwest Vegetable Association Annual Convention & Trade Show, 28-29 Nov. 2001, Pasco, WA.
- \* du Toit, L.J. 2001. Onion smut: A new problem for the Columbia Basin? Pages 37-40, In: Proceedings of the Pacific Northwest Vegetable Association Annual Convention & Trade Show, 28-29 Nov. 2001, Pasco, WA.
  - \* 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 90<sup>th</sup> 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.

**Computer programs (0)**

**Variety releases (0)**

**Depositions to public databases (0)**

**Patents granted or applied for (0)**

**Video programs (0)**

**Web pages developed (1)**

- 2009-14 (1) \* du Toit, L.J., Miles, C.A., Inglis, D.A., and Foren, A. Pacific Northwest Vegetable Extension Group (PNW VEG) website: [http://mtvernon.wsu.edu/path\\_team/vegpath\\_team.htm](http://mtvernon.wsu.edu/path_team/vegpath_team.htm) (revised regularly)

**Popular periodicals (>25)**

- 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](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](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](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](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](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](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](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 (125)

- 2014 (17) \* du Toit, L.J. Soil health for disease suppression. Building Soils for Better Crops 2014 Conference, 10 Dec. 2014, Moses Lake, WA.
- \* 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.
  - \* 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.
  - \* du Toit, L.J. Onion mycorrhizae. Onion session of the Pacific Northwest Vegetable Association Annual Convention & Trade Show, 12-13 Nov. 2014, Kennewick, WA.
  - \* du Toit, L.J. Are Washington State bean seed and crucifer quarantines sufficient or in need of revisions considering recent PNW disease outbreaks? Washington State Crop Improvement Association Meeting, 10 Nov. 2014, Spokane, WA.
  - \* 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 August 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 March 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 March 2014, Ceres, South Africa. (40 people)
  - \* du Toit, L.J. Soilborne disease management in vegetable rotations. Invited discussion with vegetable production team of
  - \* 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 February 2014, Mount Vernon, WA. (~100 people)
  - \* du Toit, L.J., and Lew-Smith, J. Managing seedborne diseases in seed production. Invited presentation, 7<sup>th</sup> 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 26<sup>th</sup> 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 26<sup>th</sup> 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 26<sup>th</sup> 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 26<sup>th</sup> 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 26<sup>th</sup> 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 2<sup>nd</sup> 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 62<sup>nd</sup> 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 30<sup>th</sup> 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, 52<sup>nd</sup> 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 51<sup>st</sup> 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 51<sup>st</sup> Vegetable & Flower Seed Conference, 21-24 Jan. 2012, Tampa, FL.
  - \* du Toit, L.J. Managing diseases in seed crops. Invited presentation, 6<sup>th</sup> Organic Seed Growers' Conference, 19-21 Jan. 2012, Pt. Townsend, WA. [http://www.seedalliance.org/organic-seed-growers-conference/2012\\_Seed\\_Growers\\_Conference/](http://www.seedalliance.org/organic-seed-growers-conference/2012_Seed_Growers_Conference/)
- 2011 (6)
- \* du Toit, L.J. Damping-off in carrot. Invited presentation, 35<sup>th</sup> 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, 56<sup>th</sup> Soil Fungus Conference, 22-24 Mar. 2010, Mount Vernon, WA. [http://soilfungus.ars.usda.gov/Mount%20Vernon\\_2010/index.htm](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, 19<sup>th</sup> 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 5<sup>th</sup> 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? 55<sup>th</sup> 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? 54<sup>th</sup> Annual Muck Vegetable Growers' Conference, 6-7 Apr. 2005, Bradford, Ontario, CANADA.
  - \* du Toit, L.J. Neck rot of onion: What's the story? 54<sup>th</sup> 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. 45<sup>th</sup> 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. 31<sup>st</sup> 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 zea* 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.

#### **Vegetable/vegetable seed pathology (120)**

- 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 Disinfection. 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 53<sup>rd</sup> 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. (~xx 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. (~xx 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. (~xx 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. 59<sup>th</sup> 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 26<sup>th</sup> Annual Conference & Trade Show, 14-15 November 2012, Kennewick, WA.
- \* du Toit, L.J. Managing *Rhizoctonia* in vegetable crops. Pacific Northwest Vegetable Association 26<sup>th</sup> 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 26<sup>th</sup> 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. 35<sup>th</sup> 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. 98<sup>th</sup> 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. 98<sup>th</sup> 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. 97<sup>th</sup> 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? 96<sup>th</sup> Annual Convention of the Western Washington Horticulture Association, 4-5 Jan. 2006, SeaTac, WA.
  - \* du Toit, L.J. Fresh vegetable disease diagnosis. 96<sup>th</sup> 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. 29<sup>th</sup> 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 (>30)**

- 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. 30<sup>th</sup> 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. 29<sup>th</sup> 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 (>125, see also **Invited presentations** above)**

- 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. as part of a 3-day agricultural tour of central WA. 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: Ger Beemsterboer, owner of Bejo Seeds, Holland (25 Jul.); Habe Roode, HygroTech Seed Co., South Africa (6 Aug.); and other seed industry members.

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 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 6<sup>th</sup> 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 Wildeklawer 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](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)

Councilor-at-Large (2014-2017)

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)

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

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

APS 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).

APS *ad hoc* committee on APS-International Seed Federation Collaboration (ISF), renamed in 2013 as the Committee on Plant Pathogen Strain Identification (since 2007); 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](http://www.worldseed.org/isf/strain_identification.html#1)) with spinach downy mildew as the 1<sup>st</sup> 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 1<sup>st</sup> disease template with EU and US stakeholders/researchers).

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**

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

- 2014 WSU Field Plant Pathology graduate class (PIP525, 3 credits), Jun.-Aug. 2012 (22 students).
- 2013 Guest lecture, Introduction to Cultivated Plants (WSU Crops/Hort. 102) for Dr. M. Pumphreys, on vegetable seed production in Washington and seed pathology concepts, 4 Nov. 2013, Pullman, WA (142 students).  
Guest lecture on seed production and seed pathology for AFS 445/545, Field Analysis of Sustainable Food, 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).  
Guest lecture, Introduction to Cultivated Plants (WSU Crops/Hort. 102) for Dr. M. Pumphreys, on vegetable seed production in Washington and seed pathology concepts, 26 Nov. 2012, Pullman, WA (139 students).  
Guest lecture, Agricultural & Food Systems 101 (WSU AFS 101, 59 students) 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 Guest lecturer, Agricultural & Food Systems 101 (WSU AFS 101, ~80 students) 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.  
Gave 2 guest lectures for PLP 478, 4<sup>th</sup> 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). Gave a 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 lecturer & 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 lecturer 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 (3)

- 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 (3)

- 2014-16 **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 macroarray for

bacterial storage rot pathogens of onion bulbs. Student switched programs/project in Aug. 2011.

### **MS students**

#### **MS committee chair (4)**

- 2014 **Sean Mullahy**, WSU Dept. of Plant Pathology. Thesis: Management of white mold in sunflower seed crops in the Columbia Basin of Washington. Student left WSU in August 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 advised (1)**

- 2014-16 **Dmitriy Lis**, WSU MS in Agriculture online degree, majoring in Plant Health Management, non-thesis option. Full-time employee of BetaSeed Inc., working on disease resistance screening in sugar beet.

#### **MS committee member (9)**

- 2012-14 **Brian Collins**, Department of Plant Agriculture, University of Guelph, Ontario, Canada. Thesis: Management of Fusarium wilt of spinach. Chair: M.R. MacDonald.
- 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 (12)**

- 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 students 'job shadow' (2)**

2007 (1) **Katie Reed**, Burlington High School senior '**Job Shadow**', 11 Jan. 2007.

2006 (1) **Lacey Hulbert**, La Conner High School senior '**Job Shadow**', 18 Oct. 2006.

#### **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**

Since 2014 Chair, WSU Organic Agriculture Research Coordinating Group. Invited by Agricultural Research Center Dean, James Moyer, to chair this group of faculty selected from across College of Agricultural, Human, & Natural Research Sciences to coordinate and expand research on economically-engaged organic agriculture in the Pacific Northwest.

Advisory Committee for Assistant Prof. Lisa Wasko DeVetter, Small Fruit Crops Horticulturist, WSU Mount Vernon NWREC

2014-17 WSU CAHNRS Promotion & Tenure Advisory Committee

2014-17 APS Councilor-at-Large

2014-15 Search committee, Nematologist, WSU Department of Plant Pathology

2012-14 WSU Center for Sustaining Agriculture & Natural Resources Leadership Team.

2012-13 Search committee, WSU Agricultural Research Director.

Since 2012 Graduate Student Admissions Review Committee, WSU Dept. of Plant Pathology. Review graduate student applications received by the department.

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, 35<sup>th</sup> 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>

Since 2010 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, 34<sup>th</sup> 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>

Since 2009 Mentoring Committee for Axel Elling, Assistant Prof., WSU Dept. of Plant Pathology.

- Graduate Student ByLaws Committee, WSU Dept. of Plant Pathology.  
 Awards Committee, WSU Dept. of Plant Pathology.  
 Library Committee, WSU Mount Vernon NWREC.
- Since 2008 Graduate Student Recruitment Committees for WSU Mount Vernon NWREC and for WSU 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 7<sup>th</sup> and 8<sup>th</sup> 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.
- Since 2005 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.
- Since 2001 Assisted with public tours of WSU-NWREC for classes from middle & high schools, Skagit Valley Community College, gardening groups, seed company field representatives, WSDA personnel, etc.
- 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

- 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

- 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), *HortTechnology* (since 2005), *HortScience* (since 2007), *Journal of Phytopathology* (since 2005), *Letters of Applied Microbiology* (since 2009), *Pacific Northwest Fungi* (2005), *Phytoparasitica* (since 2005), *Phytopathology* (since 2005), *Plant Disease* (since 2002), *Plant Health Progress* (since 2004), *Plant Pathology* (since 2006).

### Books, bulletins, popular periodicals, theses/dissertations, promotion packages, project proposals

- 2014 External reviewer for promotion to Senior Instructor II for a faculty member in the Department of Botany & Plant Pathology at Oregon State University.  
External reviewer for promotion to Full Professor for a faculty member at Cornell University.  
Reviewed three WSU CSANR BioAg progress reports.  
Reviewed Hatch proposal for a faculty member in the WSU Dept. of Plant Pathology.
- 2013 External reviewer for National Research Foundation, South Africa, for national ranking of a plant pathology faculty member at the 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 for MS thesis from University of the Witwatersrand, Johannesburg, South Africa.  
Reviewed Hatch proposal for faculty member in WSU Dept. of Plant Pathology.
- 2011 External reviewer for National Research Foundation, South Africa, for national ranking of a plant pathology faculty member at the University of Pretoria, South Africa.  
External examiner for PhD dissertation from Lincoln University, Christchurch, New Zealand.

- 2010 External reviewer of promotion application of Monterey County Cooperative Extension Farm Advisor, University of California Agriculture & Natural Resources.  
External reviewer of application package for 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 for National Research Foundation in South Africa of national ranking of plant pathology faculty member at University of Pretoria, South Africa.
- 2008 External reviewer of application for 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 of 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 for 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 of 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 for PhD dissertation of Martin Chilvers, 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

- 2013 APS Syngenta Award for outstanding recent contributions to research/extension in plant pathology.  
Received a Certificate of Recognition as a result of being nominated for the 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).
- 2011-15 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.
- 2006 APS Pacific Division Early Career Award
- 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 9<sup>th</sup> 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 ([http://mtvernon.wsu.edu/path\\_team/vegpath\\_team.htm](http://mtvernon.wsu.edu/path_team/vegpath_team.htm)) on the PNW vegetable industry, 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

- 2013-14 Provided documentation and letters in support of renewing the **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 **Special Local Needs (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 WA State Dept. of Agriculture (WSDA) **Special Local Needs (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) Special Local Needs (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

- 2014-15 Participated in 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 western OR in 2014 on various crucifer crops, including fresh market and processing vegetable crops, vegetable seed crops, oilseed crops, cover crops, forage crops, and even wild brassicas. Light leaf spot had never been documented in North America prior to this outbreak. Provided seed treatment research results and publications to Oregon Department of Agriculture (ODA) and chemical companies in support of ODA seed treatment registrations for brassica/crucifer crops for management of black leg. ODA implemented emergency ruling in July 2014 requiring testing of all brassica seed lots for the black leg pathogen for any seed lot to be planted in western OR. Permanent ODA ruling will be implemented in 2015. ODA utilized the WSDA Crucifer Quarantine to develop the temporary and permanent ruling, which was developed in part with input from Lindsey du Toit's vegetable seed pathology research and extension program.
- 2012-14 Invited by the American Seed Trade Association (ASTA) and European seed industry to work with the USDA Animal and Plant Health Inspection Service Plant Protection Quarantine (APHIS PPQ) division to address an unexpected phytosanitary quarantine implemented by APHIS PPQ in 2012 on the presence of a fungus, *Phomopsis*, on spinach seed being imported into the USA. The quarantine has resulted in >\$40 million worth of spinach seed lots being rejected at USA ports of entry, and financial loss to the USA spinach industry (growers, seed dealers, etc.) as a result of declining seed supplies of hybrids and cultivars in high demand. Wrote an emergency grant proposal titled '*Phomopsis* on spinach seed: Evaluation of a seed health assay, efficiency of seed treatments, and pathogenicity of seed isolates on spinach' to procure funding to generate research results that would enable this highly controversial quarantine issue to be resolved and normal 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*) & dormant seed in non-vegetable crucifer seed lots. Rule developed by WSDA Seed Program's Crucifer Working Group, on which I serve in an advisory capacity on seed pathology issues. I continue to serve in advisory 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 have been revised substantially in the past 4-5 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.
- 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

- 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
- 2014 \* Management of Verticillium and Fusarium wilts in spinach seed production. du Toit, L.J. Puget Sound Seed Growers' Association (PSSGA, \$26,935) via Northwest Agricultural Research Foundation (NARF); and Washington State Commission for Pesticide Registration (WSCPR, \$22,720 matching funding). (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) and WA State Commission for Pesticide Registration (WSCPR) (\$26,247) (1,2,3,4,5) \$41,247
- 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
- 2013 \* Support from Oregon State University administration for the Pacific Northwest Vegetable Extension Group's activities in 2013. \$1,000
- \* Potential benefits of arbuscular mycorrhizae in conventional and organic onion production in the Columbia Basin of Washington and Oregon. Pacific Northwest Vegetable Association. D. Sharma-Poudyal, postdoctorate; du Toit, L.J., Paulitz, T., USDA ARS; and Linderman, B. Plant Health LLC. \$11,500
- \* Screening carrot germplasm for resistance to *Xanthomonas hortorum* pv. *carotae*. du Toit, L.J. Columbia Basin Vegetable Seed Association (CBVSA) for support of MS student, Eric Christianson. \$5,000
- \* Management of Verticillium and Fusarium wilts in spinach seed production. du Toit, L.J. Puget Sound Seed Growers' Association (PSSGA, \$26,638) via the Northwest Agricultural Research Foundation (NARF); and the Washington State Commission for Pesticide Registration (WSCPR, \$22,124 matching funding). (1,2,3,4,5) \$48,762
- \* 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
- \* 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 Specialty Crops Research Initiative. \$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 Center for Sustaining Agriculture & Natural Resources 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 <i>Verticillium</i> in spinach. L.J. du Toit. WSCPR (\$32,797) and Puget Sound Seed Growers' Association (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. WA State Commission for Pesticide Registration (WSCPR, \$12,304) and Columbia Basin Vegetable Seed Association (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 Puget Sound Seed Growers' Association (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. Washington State Dept. of Agriculture Specialty Crops Block Grant. 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 Specialty Crops Research Initiative. \$200,000 for L.J. du Toit of the total \$1,549,473 requested (4 year grant). (3,5)	\$200,000

- ipmPIPE & innovative disease diagnostic tools for onion growers. Schwartz, H.F., vanKirk, J., and 20 cooperators from 8 states. USDA Specialty Crops Research Initiative. \$164,251 for L.J. du Toit of \$885,310 requested for WSU from \$3,494,024 for all cooperators. (2,3,5) \$164,251
- 2010-12 \* Development of a macroarray 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
- \* *Verticillium* 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 *Xanthomonas hortorum* pv. *carotae* 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, new assistant prof. at OSU. (2,3) \$0
- 2010 \* Management of Fusarium wilt in radish seed crops in the Columbia Basin using limestone amendments and a soil bioassay. L.J. du Toit. Washington State Commission for Pesticide Registration (WSCPR, \$17,057) and Columbia Basin Vegetable Seed Association (CBVSA, \$10,780) (1,2,3,4,5) \$27,837
- \* Management of *Verticillium* in spinach seed crops. L.J. du Toit. WSCPR (\$36,956) and Puget Sound Seed Growers' Association via NARF (\$19,203). (1,2,3,4,5) \$56,159
- \* Management of *Rhizoctonia* 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) + Pacific Northwest Vegetable Association (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 *Verticillium* in spinach. American Seed Trade Association. 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 Center for Sustaining Agriculture & Natural Resources (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. Washington State Commission for Pesticide Registration. 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. Puget Sound Seed Growers' Assoc. (PSSGA) via the Northwest Agricultural Research Foundation (NARF) (\$18,663), & the WA State Commission for Pesticide Registration (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. Columbia Basin Vegetable Seed Assoc. (CBVSA) and 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. Pacific Northwest Vegetable Association (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 & \$22,107 from the WA State Commission for Pesticide Registration (WSCPR). (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 the Pacific Northwest Vegetable Assoc. (PNVA) + \$9,548 from the 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 the Columbia Basin Vegetable Seed Association (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 \* *Cucumber mosaic virus* in spinach seed crops in western Washington. du Toit, L.J., Brown, P., and Rayapati, N. \$4,697 from the Puget Sound Seed Growers' Association (PSSGA) via NARF, \$1,100 from seed companies, & \$10,000 from WSCPR. (1,2,3,4,5) \$15,797
- \* Development of a molecular assay for *Fusarium oxysporum* f. sp. *spinaciae* & assessment of liming for management of Fusarium wilt in spinach seed crops in western Washington. du Toit, L.J. \$9,954 from PSSGA via NARF, & \$14,905 from WSCPR. (1,2,3,4,5) \$24,859
- \* Effect of powdery mildew on carrot seed production in Washington. du Toit, L.J. \$5,000 from the Columbia Basin Vegetable Seed Association (CBVSA) via NARF, & \$10,093 from WSCPR. (1,2,3,4,5) \$15,093
- \* Development of a molecular carrot seed assay to distinguish DNA from viable vs. dead cells of *Xanthomonas campestris* pv. *carotae*. 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
- \* *Cucumber mosaic virus* in spinach seed crops in western Washington. du Toit, L.J., Brown, P., and Rayapati, N. \$3,000 from the Puget Sound Seed Growers' Association (PSSGA) via NARF, \$1,000 from seed companies, & \$6,000 from WSCPR. (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. \$7,895 from PSSGA via NARF, & \$10,895 from WSCPR. (1,2,3,4,5) \$18,790
- \* Effect of powdery mildew on carrot seed production in Washington. du Toit, L.J. \$5,000 from the Columbia Basin Vegetable Seed Association (CBVSA) via NARF, & \$9,300 from WSCPR. (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. \$4,000 from PSSGA & \$6,000 from WSCPR. (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. \$6,000 from Western Region IR-4 Program, \$2,000 from BASF Corporation, & \$2,000 from Syngenta Crop Protection. (1,2,3,4,5) \$10,000
- \* Efficacy of neonicotinyl insecticides & Actigard for management of *Iris yellow spot virus* in onion seed crops in Washington. du Toit, L.J. \$7,500 from CBVSA via NARF, & \$11,460 from WSCPR. (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. \$5,000 from CBVSA via NARF, & \$8,500 from the WSCPR. (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. \$7,500 from CBVSA via NARF, & \$9,852 from WSCPR. (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. \$3,500 from CA Processed Onion and Garlic Research Committee of CA League of Food Processors, & \$5,000 from NV Onion and Garlic Advisory Board. (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. \$7,000 from Puget Sound Seed Growers' Assoc. (PSSGA) via NARF, & \$20,000 from WSCPR. (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. \$6,000 from PSSGA via NARF, & \$7,500 from WSCPR. (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. \$5,000 from CBVSA via NARF, & \$7,500 from WSCPR. (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. \$3,500 from CBVSA via NARF, & \$7,500 from WSCPR. (1,2,3,4,5) \$11,500
- \* The significance and management of seedborne *Botrytis* causing neck rot of onion. du Toit, L.J., & Pelter, G.Q. \$3,820 from PNVA & \$5,248 from WSCPR. (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. (\$2,706.50 tuition waiver/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 (CFCAB) 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. \$6,000 from PSSGA via NARF, & \$12,920 from WSCPR. (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. \$9,000 from PSSGA via NARF, & \$10,530 from WSCPR. (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. \$10,500 from CBVSA via NARF, & \$7,500 + 7,312 from WSCPR. (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 <i>Botrytis</i> of onion. \$5,000 from Nevada Onion & Garlic Advisory Board, & \$5,000 from California Onion & Garlic Research Committee. (1,2,3,4,5)	\$10,000
	* Survey of Washington onion and onion seed crops for <i>Iris yellow spot virus</i> , a new & potentially devastating disease in the Pacific Northwest. Pappu, H.R., and du Toit, L.J. \$3,600 from CBVSA, & \$4,500 from WSCPR. (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 <i>Botrytis</i> species pathogenic to onion. du Toit, L.J., and Folwell, R. WSU Agricultural Research Center. (1,2,3,4,5)	\$14,706

	* Evaluation of the biology, epidemiology, & management of Botrytis neck rot/scape blight of onion bulb & seed crops. du Toit, L.J. \$10,500 from CBVSA via NARF, & \$8,820 + \$10,099 from WSCPR. (1,2,3,4,5)	\$29,419
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. \$3,132 from PSSGA via NARF, & \$9,182 from WSCPR. (1,2,3,4,5)	\$12,314
	* Biology & management of leaf spot of spinach seed crops in western Washington. du Toit, L.J. \$10,970 from PSSGA via NARF, & \$10,970 from WSCPR. (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 <sup>th</sup> Annual Virus Inclusion Workshop, University of Florida, Gainesville, FL, 29-31 Jan. 2001. (1,2,3,4,5)	\$500
Total grants received		<u>\$3,396,129</u>

### Grants submitted & pending

2014 (2)	* du Toit, L.J. Application for a 2015 WSU CAHNRS Undergraduate Internship for summer 2015. Submitted 2 Oct. 2014.	\$4,000
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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 research proposal with Lammerts van Bueren, E. (Wageningen University, Netherlands); Groot, S.P.C., Scholten, O.E., and Postma, J. (Plant Research International, Netherlands); van Diemen, M., and van Selling, T. (Enza Zaden, Netherlands), de Visser, J. (Pop Vriend, Netherlands), Dijkstra, J. (Bayer CropScience Vegetable Seeds, Netherlands), Courand, D. (Syngenta Seeds B.V., Netherlands), Hosobuchi, Y. (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 by du Toit, Myers, and Koike to be paid by seed companies (\$xxx,xxx).

Total grants submitted and pending	\$xxx,xxx
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### Grants submitted but not funded (35)

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 microarray 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 microarray 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 microarray 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 microarray 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

- 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) \$19,087
- 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 research funded by PSSGA, CBVSA, and WSCPR (\$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, & 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, Klaustermeyer Farms, Inc., Organic Seed Alliance, Precision Seed Production, Schafer Ag Services, Seminis Seeds, Silverado Ranch Supply, Skagit Seed Services, Sorensen Seed Co., Syngenta Crop Protection, & 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 various 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>\$314,742</u>
	Total grants and gifts received	<u>\$3,590,282</u>