



Phoma lingam (sexual stage: *Leptosphaeria maculans*) is a fungus that can infect a range of cruciferous crops including *Brassica* species (broccoli, Brussels sprouts, cabbage, collards, canola, forage rape, kale, mizuna, mustards, oilseed rape, oilseed turnip rape, rutabaga, turnip, etc.), *Raphanus* (daikon and radish), and *Sinapis* (white and yellow mustard).

Cultural controls should be utilized for all *Brassica* vegetable and seed production; methods include:

- Control of all susceptible weeds (including tansymustard, hedge mustard, penny-cress, Birds rape mustard, western yellow cress, wild turnip, and wild radish) and volunteer *Brassica* and radish.
- If possible, delay spring plantings to avoid periods of ascospore release; intermittent rains promote release.
- Do not plant in or adjacent to a site where black leg has occurred within the last 3 to 4 years; plantings within ¼ mile of a field containing black leg-infected residues are at high risk for black leg.
- Do not plant *Brassica*, *Raphanus*, or *Sinapis* species as cover crops; use cereals, vetches, and/or clovers instead.
- Plant only seed certified to be free of *Phoma lingam* by official testing.
- Hot water seed treatment for 25 to 30 min. in water at 122°F (50°C) or use a fungicide seed treatment.
- Bury residues as soon as possible after harvest by deep plowing, or destroy plant debris. Multiple flailing passes (3) followed by a shallow incorporation may be sufficient.

Fungicides labeled for seed treatment of leafy or head and stem *Brassica* crops in Oregon include:

- Coronet (FRAC Group 7 + 11) (commercial seed treaters) is very effective for seedborne *Phoma* and other fungi.
- Dynasty (FRAC Group 11) is not completely effective on seedborne *Phoma*.
- Maxim 4FS (FRAC Group 12) is not very effective on seedborne *Phoma*.
- Mertect 340-F (FRAC Group 1) is very effective on *Phoma* and can be used on head & stem brassicas as well as root crop crucifers (supplemental label), and on crucifers seed crops (SLN OR-100014).
- Rovral 4F (FRAC Group 2) (commercial seed treaters) is effective on seedborne *Phoma* at 1 pint rates but is not completely effective at half pint rates; for use on crucifer seed crops only (SLN OR-140013).
- 42-S Thiram (FRAC Group M3) is not very effective on seedborne *Phoma*.

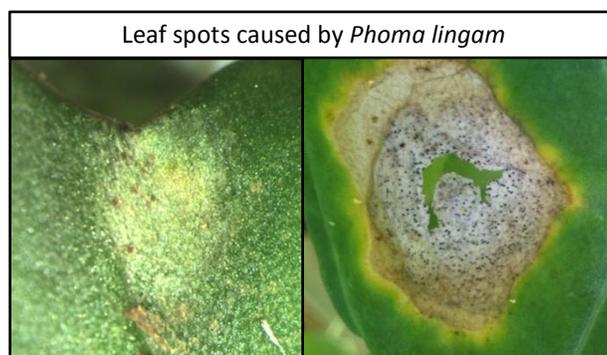
Protective fungicide sprays should be used to prevent black leg from occurring in *Brassica* seed fields and they may be necessary during certain seasons for *Brassica* vegetable crops. Typically, 3 or more fungicide applications will be necessary for seed fields when disease pressure is high and conditions are wet or humid with mean temperatures between 46°F and 59°F. For fall-planted seed fields, the first fungicide application should be made after the fall rains commence and just before ascospores begin to release. A second application should be made in early to mid-winter if conditions do not remain cold and dry. The third application can be done in the spring before bolting begins. In specialty seed crops, it may be necessary to make more than three (3) fungicide applications, especially if black leg is found in a field during the fall or early winter months. These fungicide applications are necessary to slow disease spread across the field and then to protect the upper canopy the following spring so that the developing seed pods are not infected by *Phoma lingam*, thus avoiding the risk of seedborne *Phoma*. Tanking mixing of two fungicides of different Fungicide Resistance Action Committee (FRAC) groups is strongly recommended to prevent the development of fungicide-resistant *Phoma lingam*.

Foliar fungicides labeled for use on turnip crops include:

- Cabrio EG or Quadris Flowable (FRAC Group 11)
- Rovral 4F (FRAC Group 2) in seed fields only (SLN OR-130001)

Foliar fungicides for leafy or head and stem brassicas include:

- Cabrio EG or Quadris Flowable (FRAC Group 11)
- Rovral 4F (FRAC Group 2) in seed fields only (SLN OR-130001)
- Procuere 480SC or tebuconazole formulations (FRAC Group 3) such as Onset, Tebustar, Monsoon, Orius, Tebu-Crop, Toledo, etc.
- Inspire Super (FRAC Group 3+9)
- Priaxor Xemium (FRAC Group 7+11)
- Quadris Top (FRAC Group 11+3)



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