



MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS

Phytophthora root rot of lavender identified in Ontario

As acreage of lavender increases in Ontario, it is inevitable that new pests will begin to show up in the field. Up until now, the pests of lavender have not caused major economic damage. Four-lined plant bugs can cause unsightly or unmarketable lavender products, but do not significantly affect the health of the plants. Septoria leaf blight can weaken plants, and may cause a reduction in growth, but does not kill lavender plants. In other lavender growing regions, several aggressive root diseases are known to cause major crop damage and/or destruction. These include Fusarium, Phytophthora root rot, and shab. One of those diseases, Phytophthora root rot has now been found in Ontario.

Following weeks of heavy rain, one of the sites of the provincial lavender cultivar trials showed sudden wilt of foliage and death of the 3 to 4 year old lavender plants in July. An area of around 100 plants was severely affected (Figure 1). The site is characterized by sandy loam soil and flat ground. The soil is covered with black woven plastic mulch (landscape fabric) and a thin layer of wood chips. Due to the excess rain and the lack of a slope, the soil may have stayed saturated for long periods of time.



Figure 1. A portion of the area affected by Phytophthora root rot in one provincial cultivar trial. Some plants were killed entirely while others were only partially affected.

Plant samples submitted to the lab for diagnosis revealed the presence of *Phytophthora cactorum* and *Phytophthora nicotianae*. In 2012, a similar root rot was identified at another lavender farm in Ontario, but only affected four plants within a row. *Phytophthora cactorum* was also isolated from these plants, and later confirmed to cause seedling collapse in a greenhouse experiment. *Phytophthora nicotianae* has been reported to cause lavender root rot in other regions. It is possible that both *Phytophthora* species are involved.

Phytophthora belongs to a group of fungal-like organisms called oomycetes, or water moulds. Species of *Phytophthora* prefer very wet conditions and can spread rapidly with swimming spores when the soil is saturated. Late blight of potatoes, the cause of the Irish Potato Famine, is caused by a species of *Phytophthora*. *Phytophthora cactorum* causes root rot on a fairly wide range of mostly perennial crops such as ginseng, strawberries and tree fruit. *Phytophthora nicotianae* causes root rot on some crops and ornamentals within the potato/tobacco family (e.g. tomato, tobacco, petunia). Growing lavender after some of these crops/ornamentals may increase the risk. However, the pathogen can produce long-term survival spores that will live in the soil for many years. The disease can also be spread through the planting of contaminated plants.

Phytophthora root rot can appear similar to winter kill in that some branches of the plant can be affected, while others remain healthy (Figure 2). However, Phytophthora root rot will cause green tissue to suddenly collapse during the growing season, while plants affected by winter kill come out of the winter with the damage. It is most likely to appear after heavy rains and mild temperatures. Many of the plants in the cultivar trial that are

affected by the disease still have a few unaffected branches. It is possible that some of the plants can recover from the disease if wet conditions do not return.



Figure 2. Symptoms of Phytophthora root rot appear as suddenly collapsed green tissues that quickly dry up. Some sections of the plant may remain healthy, at least initially.

Limited experience with this disease in Ontario, as well as observations in other regions, suggests that this disease only appears when conditions are highly favourable for development. It may go unnoticed for years before suddenly killing plants under wet conditions.

There are no conventional or organic products registered for the control of any root disease of lavender. The best way to control the disease is to avoid its development in the first place. While research is required to learn more about this disease in Ontario, there are some strategies that are likely to reduce the chances of the disease developing:

1. Ensure good soil drainage. Even a sandy loam soil can develop disease if the ground is flat and there is nowhere for the water to go when excessive rainfall occurs. At least a gentle slope is beneficial for removing standing water around plants. Tile drainage may be needed even in well-drained soils to rapidly remove excess water.
2. If possible, avoid growing lavender on sites previously cropped to perennial horticultural crops or crops in the potato family.
3. Do not replant sites with lavender if they have been affected by disease. When wet conditions return, the disease is likely to reappear.
4. Ensure purchased plants are free of disease. Avoid collecting cuttings from infested areas of the field because spores may be present on the plant material.
5. Avoid over-fertilization. Well fertilized plants can better defend against pathogens, but lavender only requires a small amount of nitrogen fertilizer. Excess fertilization with synthetic fertilizers, manures or composts can cause succulent growth that is more susceptible to Phytophthora root rot. Avoid adding more than 50 kg/ha of nitrogen each season.
6. Scout fields regularly for pest issues. If the disease appears on a plant, remove the affected plant and its neighbouring plants, which may already be infected even if they do not show disease symptoms. Fix any drainage issues within that area.

Both sites on which this disease has appeared had plastic or fabric mulch around the plants. It is possible that mulches reduce drying of the soil and can contribute to higher disease. However, they also provide significant benefits in labour savings and plant growth. More research is required to determine the impact of mulches on disease development.

Conventional lavender growers have the option to fumigate affected soils. Fumigation can greatly reduce soil inoculum, but cannot completely sterilize the soil. For fumigants registered for use on lavender, consult an OMAF

and MRA specialist. Some cultivars may be less susceptible to the disease. Since the disease occurred in a cultivar trial, a rating of disease severity on the different cultivars will occur in the fall, but it is likely that more research will be required to determine which cultivars, if any, are less susceptible.

If you suspect you have a soil-borne disease on lavender in Ontario, please report it to Sean Westerveld, Ginseng and Medicinal Herbs Specialist, OMAF and MRA.

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