Avoiding Phytophthora blight

Site selection
Select fields with no history of Phytophthora blight, if possible, and are isolated from infested fields. Select fields with good internal drainage. Experience has shown that the disease may be manageable if the soil does not stay wet for long periods of time. Low areas are acceptable if the soil is deep and well drained. Creek bottoms are at risk of becoming infested due to flood waters depositing spores on the soil.

Sanitation and water management
Beware of borrowing tractors and implements from other farms, and of lending such equipment to other farms. *P. capsici* can be transferred on anything that can transmit soil.

A common source of *P. capsici* is irrigation water. Many streams contain the fungus and, as a result, are not recommended as a source of irrigation. Likewise, ponds that could contain water that drained from an infested field should not be used for irrigation. Unfortunately, ponds that appear to be safe may also contain the fungus.

Be prepared for an unexpected appearance of the disease on the farm by correcting drainage problems, if any exist. Consider using a land plane to eliminate dips in the field. Cut water furrows across raised beds planted on a contour, so that they do not trap water. Use a subsoil plow to break up hardpans and improve internal drainage. Avoid excessive irrigation.

Reacting to Phytophthora blight

Current Year
Sanitation
If a small area is affected, consider removing and destroying the diseased plants or disk ing the area, if irrigation lines are not present. These practices should only be conducted if it is possible to avoid spreading the fungus to healthy plants. Disking should begin with a border of healthy plants, working in toward the affected area.

In severe cases, attention should turn to protecting non-infested fields. Clean soil from equipment and shoes after working in infested fields and before working in clean fields.

Piles of culled fruit should not be located where they can drain into non-infested fields.

Chemical control
Crop protection chemicals, applied either as a preventive or after the disease appears, are rather ineffective for controlling Phytophthora blight. Product performance is least under conditions of heavy disease pressure and is highly dependent on attention to good water management practices. Fungicides are essentially useless against the fruit rot phase of Phytophthora blight in crops in which the fruit are in contact with the soil, such as unsupported vine crops.

Most commercial vegetable fields are routinely sprayed with fungicides for basic disease control. More specialized fungicides may be used for control of Phytophthora blight. However, the degree of control they provide may not be worth the added cost. The decision to use the Phytophthora fungicides should be based on factors such as the severity of the case, the yield potential of the crop, and the recent and expected weather.

Foliar sprays protect against infections caused by airborne spores, generally fruit rots and leaf spots. Products containing mefenoxam tend to outperform other fungicides. The drawback to the use of mefenoxam is the ability of the fungus to readily develop resistance to it. This problem also exists to some extent for the other Phytophthora blight fungicides. To combat this problem, specialized fungicides should be rotated with non-
related specialized fungicides, and should be tank mixed with a broad spectrum fungicide. Sprays of phosphorus acid (phosphite) products such as PhosTrol, ProPhyt, Agri-Fos, etc. provide suppression of Phytophthora blight and should not be subject to resistance. Crop clearances and tank mix precautions should be checked on all product labels. For a current list of chemical recommendations, refer to the University of Tennessee publication *Commercial Vegetable Disease Control Guide*, W141.

**Following years**

**Crop rotation**

Use the following table to develop a crop rotation plan. Highly susceptible crops cannot ever be safely planted in infested fields, because it is not known exactly how long the oospores can survive. It is known that oospores can survive for several years, and fresh ones can be produced if susceptible host plants (either crops or weeds) grow in the field. Plant host crops whenever possible, since the fungus does not reproduce on them. Wait at least three years before planting a moderately susceptible or highly susceptible crop, and then incorporate all of the recommended practices for management of Phytophthora blight in infested fields.

<table>
<thead>
<tr>
<th>Highly susceptible crops</th>
<th>summer squash, pepper, pumpkin, watermelon, cantaloupe, other melons, cucumber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderately susceptible crops</td>
<td>tomato, eggplant, lima bean, snap bean, gourd, winter squash, spinach, carrot, English pea</td>
</tr>
<tr>
<td>Slightly susceptible crops</td>
<td>tobacco, cotton, beet, turnip, Swiss chard, radish, onion, cauliflower</td>
</tr>
<tr>
<td>Nonhost crops</td>
<td>corn, all grasses, soybean, wheat, broccoli, cabbage, kale, kohlrabi, mustard, basil, chives, celery, dill, parsley</td>
</tr>
<tr>
<td>Susceptible weeds</td>
<td>nightshade, velvetleaf, purslane, jimsonweed</td>
</tr>
</tbody>
</table>

**Planting practices**

Adjust planters so that depressions are not produced around transplants.

Non-vining crops and summer squash: Prior to planting, use a bed shaper to produce high beds with a dome shape, so that water drains away from the plant. Covering with a plastic film mulch helps to maintain the high center throughout the season. If high centers cannot be produced, beds should not be mulched with plastic film. Water that collects in depressions would aid splash dispersal of zoospores during rains.

Vining crops: Raised beds are not recommended for vining crops, since fruit that develops in the low area between beds will be more subject to fruit rot. Mulching with straw, or planting into the stubble of a no-till cover crop such as rye, wheat, or vetch would reduce splash dispersal of spores, and would help protect the fruit of vine crops from contact with the soil.

**Water management**

Follow the water management recommendations provided under “Avoiding Phytophthora blight.” In infested fields, avoid planting low areas altogether. It is helpful to subsoil row middles, if plant size allows the passage of the tractor.

**Chemical control**

Preplant fumigation is effective in reducing, but not eliminating, the *P. capsici* population. Preplant, shankd application of methyl bromide/chloropicrin, Telone C35, and Vapam have worked well. However, it should be remembered that a severe epidemic can result from a low initial population during rainy seasons.
Mefenoxam (e.g. Ridomil), applied to the soil and used in combination with other management practices, is somewhat effective in reducing the root and crown rot phase of Phytophthora blight. However, *P. capsici* can become resistant to Ridomil rather quickly.

For information on foliar sprays, refer to discussion above (Current year).

**Resistant varieties**

Resistant varieties are available in pepper. Paladin, Aristotle, Revolution, and Emerald Isle are moderately resistant to Phytophthora blight. Other management practices should still be used when these varieties are grown. The tough rinds of pumpkin varieties such as Li’l Ironsides, Iron Man, Apprentice, and Crunchkin are somewhat resistant to fruit infection.

**Precautionary Statement**

In order to protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store, or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label. Persons who do not obey the law will be subject to penalties.

**Disclaimer Statement**

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticides registrations are continuously reviewed. Should registration of a recommended pesticide be canceled, it would no longer be recommended by the University of Tennessee.

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