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Potato Vine-Killing in Delaware

The Purpose of Vine-Killing

Vine-killing potatoes can be an important step in improving potato quality and enhancing disease control. Because Delaware producers primarily use early-maturing potato varieties that mature naturally during the hot summer season, they have not had to vine-kill as frequently as producers in other regions. In recent years, however, plantings of later-maturing varieties that reach maturity during cooler conditions in late summer or early fall have increased, making vine-killing a possible effective cultural practice for Delaware.

The primary objective of vine-killing is to prepare the tubers for harvest and, possibly, for subsequent storage. Terminating the movement of carbohydrates from the tops of the plants into the tubers causes physical and chemical changes in the tubers. Tuber bulking ceases once the potato foliage stops sending carbohydrates to the fruit. In Delaware, the season is generally long enough for potatoes to reach maximum yields before vine-killing stops tuber sizing and dry-matter accumulation.

Periderm, or tuber skin development, does not occur until tuber growth stops or slows significantly. The development of a skin, often called "skin set," and the loosening of the tuber from the stolons are major reasons for vine-killing. This enhances the tuber's ability to endure harvest, packing, shipping, and storage. Tubers with a thick, well-set skin that easily detach from the vines are less susceptible to bruising

and disease. The tubers will also lose less water during shipment or storage. And with less vine and weed to go through a harvester, harvest is easier.

Vine-killing can also be considered as a form of disease control. In seed production regions, aphid populations are monitored to set critical vine-killing dates in relation to control of virus diseases. When conditions are conductive for late blight, vine-killing can help stop the spread of late-blight fungus spores from the foliage to the tubers at harvest.

There are potential dangers in vine-killing. By cutting the growing season short, yield may be reduced. While this should not be a problem in Delaware, with its long growing season, there is a potential danger in killing vines too early, before potatoes reach their yield potential. It is important to estimate the current yield level when considering vine-killing. You must calculate both gross tonnage and the size distribution of the tubers, evaluating the percentage of tubers that have reach the large "Chefs" category as well as the percentage that falls below the minimum market size standard of 1-7/8 or 2 inches.

The other danger is killing completely green potatoes too quickly in hot, dry conditions. Stem-end browning can occur. In Delaware, this problem is generally avoided because early varieties that mature in the summer are often in some stage of senescence as harvest approaches. If, as it is believed, killing the remnants of vines during the summer eliminates host tissue for late blight, lower rates of vine desiccants can be effective. In other words, the combinations of mature, senescent vines and the proper rate avoids internal quality problems.

Later-maturing varieties such as Norwis or Katahdin, which typically reach maturity in the late summer or fall, may require more time for vine-killing to take effect. This is especially true for varieties with large vines. When scheduling vine-killing operations, keep the timing in mind, along with potential yield and size of the tubers. Split applications may also be used during these cool conditions to kill vines effectively.

Vine-killing with late varieties also can help avoid second growth and nob development, conditions that may occur from the "starting and stopping" of growth when senescent vines go through dry and then wet growing conditions. Typically, this is not a problem with early-maturing varieties that reach maturity in the summer.

Vine-killing is achieved by various methods-rolling vines, roto-beating or flailing, and even propane flaming. However, desiccation of vines with chemicals has been the most consistent and effective. The following recommendations are for the Delaware conditions.

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Timing of Vine-Killing

The first step in timing applications is to look at the vines and determine the stage of maturity of both vines and tubers. It is important to estimate the yield potential and size of the tubers. If the tops are lush and green, they will be harder to kill than if they had begun to die down on their own. The weather is also a key element in deciding how much material to use and how long before you can begin harvest. Vines die faster if they are under heat- or drought-stress, so less desiccant will be required. Vines killed in July may require only 5 to 7 days before harvest. However, vines killed in September, especially of a late-maturing variety, may require as much as three weeks.

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