

Keeping Late Blight in Your Rearview Mirror – Planning for 2010 – Home Gardener Version

Tom Zitter, Department of Plant Pathology, Cornell University, Ithaca, NY 14853

taz1@cornell.edu

The 2009 season was very challenging for most home gardeners because of weather conditions unsuitable for many crops and for the widespread occurrence of late blight in much of the Northeast US and beyond. This was particularly true for tomato and potato production. Late blight (LB), the fungal-like disease responsible for the Irish Potato Famine, occurred on tomato transplants much earlier in the season (mid-June) compared with all previous recorded occurrences. Also environmental conditions in 2009 during June and July were very conducive for the occurrence and spread of late blight inoculum, since the organism responsible, *Phytophthora infestans*, prefers cool and wet conditions for its reproduction and spread.

Plant pathologists at Land Grant Universities around the country (including Cornell University for New York State) have agreed to a numbering system to help identify the main characteristics associated with the current LB genotypes. Think of it as knowing what the seasonal flu virus will be for a given year, so that a seasonal vaccine can be developed to lessen the chance of getting the flu. And just as for humans where a seasonal vaccine will not protect you against 2009 H1N1 flu, how tomatoes respond to late blight can change depending on which isolate (genotype) of late blight is occurring. In 2009, the majority of losses for tomato in the Northeast was due to infections with genotype US22. This genotype is relatively new for the US, and in addition to infecting tomato, also infected potato and solanaceous weeds. As bad as late blight was in 2009, it could have been a lot worse if for tomato the plants had been exposed to US11 or US17 which are even more virulent for tomato, or in the case of potato, if US8 had been disseminated more widely, since it causes more damage than seen with US22 infections in 2009.

Genetic resistance for plant pathogens, including late blight, is known and is being incorporated into tomato varieties using conventional plant breeding techniques. An accompanying table lists the performance of tomato cultivars for late blight, and includes the performance of reds, heirlooms, large cherry and small-fruited types, some with known genes for resistance or tolerance for late blight. The most widely known genes for LB resistance are *Ph1*, *Ph2* and *Ph3*. The *Ph3* gene provides the strongest protection since it confers resistance for multiple LB genotypes including US22, unlike *Ph1* or *Ph2* which are genotype specific, and thus do not provide the necessary high level of protection.

Where do we stand for the 2010 growing season? A listing of the performance of tomatoes for exposure to late blight (LB) is currently available, and may accompany this report. Choosing cultivars with resistance or tolerance is always a good starting point for disease control. For tomato growers in the affected areas (most of the Northeast in 2009), the slate is wiped clean in terms of survival of LB inoculum from last year. The late blight organism is an obligate parasite, meaning it must survive on living tissue. This source of inoculum can be LB-infected potato tubers that were saved or survive in compost piles or appear as volunteers that overwintered in the soil from last year. In the case of potato tubers as a potential source, make sure none survive in compost piles or as volunteers, and if present, dispose of them properly before you begin preparing the soil this spring. Use clean tubers to establish your new crop in 2010. Tell your neighbors to do the same! The late blight isolate (US22) is not capable of surviving in the soil and is not seedborne in tomato. So growers do not need to rotate away from the planting area they used in 2009 specifically for LB control. However, I suspect most gardeners also have disease problems with two common fungal diseases, early blight and Septoria leaf spot, for which rotation is critical. A few cultivars on the tomato list also have good resistance or tolerance for early blight and should be considered. The development of triple resistant tomato varieties (LBR, EBR and SLSR) is currently underway at Cornell, with important field trials for selection of resistance and multiple fruit types set for 2010. Two fungicides which worked well in our research plots last year for all three diseases were chlorothalonil and copper. Home gardeners who choose to spray have both available in the state; for example Bonide Fung-onil Multiple Purpose concentrate (chlorothalonil) and Bonide Copper Fungicide (Bordeaux Modern Replacement).