

FREQUENCY, CHANGES AND DISTRIBUTION OF FUNGICIDE SENSITIVITY IN *CERCOSPORA BETICOLA* POPULATIONS FROM 1998 TO 2012

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Cercospora leaf spot, a potentially serious disease of sugar beet throughout the world, is caused by the fungus *Cercospora beticola*. The disease is managed by crop rotation, resistant varieties and timely fungicide applications. Fungicide resistance in *C. beticola* is a concern where ever sugar beet is grown. Populations of *C. beticola* from the US have been monitored for changes in sensitivity to fungicides to four classes of fungicides using bulk spore germination, growth reduction and spore germination compared to baseline sensitivities. The number of isolates with resistance to tin at 2 ppm has decreased from 65% to < 10% during this period, ostensibly due to registration of new fungicides. Percentage of isolates with resistance to thiophanate methyl initially decreased but returned quickly in local populations. Sensitivity of isolates to the triazole fungicides as measured by EC₅₀ values gradually increased over time, but increase dramatically in 2011. Reduced sensitivity correlates with increased disease losses. Triazole resistance is associated with overexpression of the Cyp51enzyme in *C. beticola*. There has been a 40 fold increase in EC₅₀ values since the introduction of pyraclostrobin compared to baseline values of isolates recovered from ND and MN. In 2011, isolates of *C. beticola* were collected in MI from fields with high incidence of *Cercospora* leaf spot. These isolates had high EC₅₀ values to pyraclostrobin and had the G143A mutation. Bulk spore samples collected from 1412 fields in 2012 showed that 24 of the samples (1.7%) contained the G143A mutation. Limited testing in several European populations has shown high levels of resistance to triazole and QoI fungicides, and the presence of the G143A mutation.