

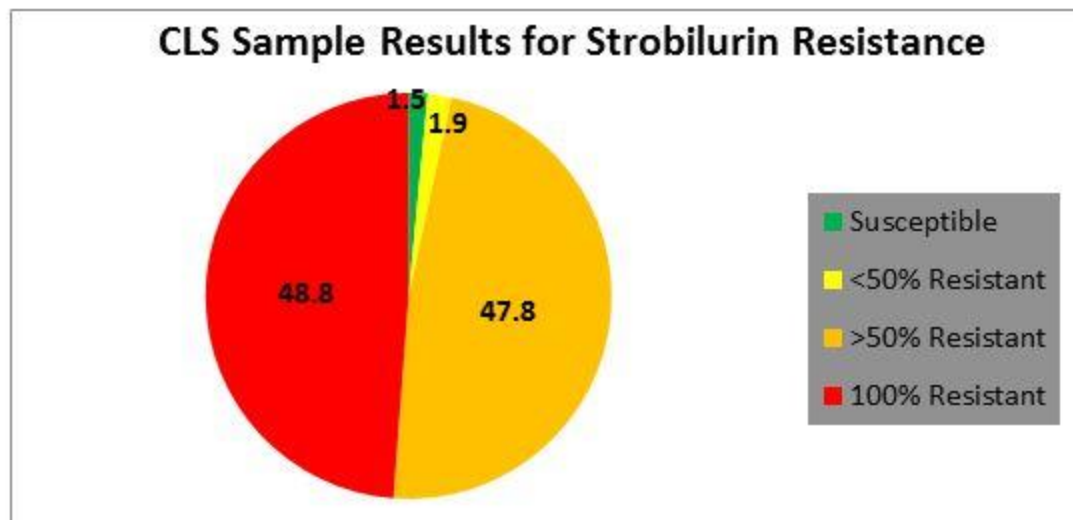


Cercospora Leaf Spot: Q & A 2017

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Q: Why are there no strobilurins (Headline, Gem, Priaxor) in the CLS fungicide recommendations for 2017?

A: A large percentage of the CLS population is resistant to strobilurins. When resistance levels are this high the strobilurin fungicides will be ineffective against CLS.



Q: Why are tank-mix partners so important for 2017?

A: Tank mix partners (Coppers, EBDCs, and Topsin) significantly increase CLS control when applied with a main chemistry, even though they are not effective as stand-alone treatments. With strobilurins out of our program, only two main products are left: triazoles and tin products. These remaining chemistries need to be protected from further resistance development.

Q: Why is copper being recommended as a tank-mix partner?

A: While copper is not an effective stand-alone fungicide, it has proven beneficial as a tank-mix partner in fungicide trials conducted at SMBSC and at Michigan Sugar trials. Also, we are recommending copper *hydroxide* or copper *oxychloride* formulations; these are different than the copper sulfates used previously. We are not recommending the use of copper sulfates in 2017.

Q: Are there biologicals that could be used as tank-mix partners?

A: There are several biological products available that claim to provide control of CLS, such as BalladPlus and Lifegard. However, fungicide trials conducted in North Dakota and Michigan indicate that EBDC and copper products are more effective tank-mix partners than biologicals.

Q: Why is Tin + Topsin recommended for the first application?

A: Tin + Topsin has shown to be one of the most effective tank-mixes for controlling CLS early on in the season. If instead the first spray contained a triazole and only 5 applications were needed, we would end up using triazoles for over 50% of the fungicide applications. This could potentially lead to more resistance development problems. CLS is less likely to develop resistance to tin than the triazoles.

| Fungicide Class | FRAC Risk of Resistance |
|--|-------------------------|
| QoI (Strobilurins) Headline, Gem, Priaxor | High |
| Benzimidazoles (Topsin) | High |
| Triazoles (Proline, Minerva, Inspire, Enable) | Medium |
| Tin | Low - medium |
| EBDC | Low |
| Copper | Low |

Q: Why shouldn't we tank mix glyphosate with our fungicide application?

A: Tank mixing will compromise weed and disease control. CLS fungicides are protectants that require thorough leaf coverage to be effective. To provide adequate leaf coverage the correct spray volume and nozzle selection are important. Glyphosate requires lower water volume and spray pressure with Air Induction style nozzles. Fungicides need higher water volume (**20 gpa**) and high spray pressure (**100 psi**) with Hollow Cone or Flat Fan nozzles. Deviating from these recommendations will sacrifice efficacy of disease control or weed control. We cannot afford to compromise the effectiveness of disease control with inoculum at high levels.

Q: Is there a tin usage limit per season?

A: There is a limit to the amount of active ingredient in the tin fungicides that can be applied in a season. This limit equates to 24 oz/acre of the 4L products or 15 oz/acre of the 80WP products.

Q: Does hydrogen peroxide provide control for CLS?

A: There is no evidence to suggest that hydrogen peroxide would provide adequate control of CLS. Furthermore, peroxides form free hydroxyl radicals to give hydrogen peroxide biocidal efficacy. It is currently understood that these radicals would not affect CLS because CLS destroys plant tissue with free oxygen radicals via the cercospora produced toxin cercosporin. So, hydrogen peroxide and CLS do the same thing to the plant. We have found no pesticide labels for hydrogen peroxide that list CLS control on sugar beets.

Q: Can we cut rates since we are tank mixing?

A: After the damage caused by CLS during the 2016 season and the high inoculum load going into 2017, it would be best to apply full rates of fungicides unless otherwise noted. Applying a full rate will give us a better chance at controlling CLS and reducing chances of resistance development.

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