

SOYBEAN APHID RESISTANCE TO PYRETHROID INSECTICIDES: RETHINKING HOW WE MANAGE SOYBEAN APHID

Robert Koch ^{1/}

Soybean aphid remains a significant pest of soybean in parts of the north central U.S. Recent development of insecticide resistance in this pest creates a new challenge for soybean production. Multiple lines of evidence, including reports of field level failures, and data from replicated efficacy trials and laboratory bioassays, that indicate that some populations of soybean aphid from Minnesota, North Dakota, South Dakota, Iowa and Manitoba have developed resistance to some pyrethroid insecticides (bifenthrin and lambda-cyhalothrin).

The development of insecticide resistance in soybean aphid is likely due to several factors. First, management of soybean aphid has relied on only a few insecticide groups (mainly pyrethroids and organophosphates) for 15+ years. Second, soybean aphid infestations in Minnesota and neighboring states have been more persistent than in other parts of the region, which has resulted in a long history of selection pressure for development of resistance. Third, certain management practices (i.e., application of insecticides below economic threshold, tank mixing insecticide with herbicide applications) have resulted in soybean aphid populations being exposed to insecticides more than necessary, which further increased selection pressure.

In response to the challenge posed by insecticide-resistant soybean aphids, I encourage growers, consultants and applicators to rethink how this pest is managed. First, treat fields only when needed. Doing so will reduce the selection pressure for further development of resistance. Fields should be scouted on a regular schedule and the economic threshold (250 aphids per plant) should be used to determine when to apply insecticides. Second, if a field needs to be treated, make sure the insecticide application is performed correctly (e.g., effective insecticide, proper nozzles, spray volume and pressure, and favorable environmental conditions). After insecticide applications, scout fields again after 3 to 5 days to ensure the product provided the level of control expected. Third, if a field needs to be retreated due to a failure, alternate to a different insecticide group for the follow-up application. For example, if a field was treated with a pyrethroid and a follow-up insecticide application is needed, then an insecticide from different insecticide group, such as an organophosphate, should be selected.

^{1/} Assistant Professor and Extension Entomologist, University of Minnesota

Until aphid-resistant soybean varieties and other management tactics become more widely available, management of soybean aphid will continue to rely on scouting and threshold-based application of insecticides. There are few insecticide groups available (labeled) for management of soybean aphid. This short list of insecticide groups is under threat of getting even shorter due to development of pest resistance to insecticides and potential regulatory actions. The agricultural community must work together to preserve the effectiveness of and continued access to these products for protection of soybean and other crops from pests.