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Use of reduced-risk insecticides to control insects to safeguard environment

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In the preceding few years, there has been substantial discussion of the development and use of “reduced-risk” pesticides in agricultural crops.

This should be of particular interest to local growers because several new insecticides recently being researched at the Montana State University Western Triangle Agricultural Research Center are considered reduced-risk compounds. These new compounds are becoming increasingly important in our insect control programs.

Reduced-risk pesticides are newer classes of compounds that pose a lower health risk to humans and the environment. This new classification and registration process resulted when the EPA implemented the Reduced-Risk Pesticides Initiative in 1993 to provide incentives to encourage the development and registration of pesticides that present lower risks to public health and the environment, and to encourage the replacement of higher risk pesticides in the marketplace.

For example, some of the low-risk insecticides being tested are, dimilin (a growth hormone that inhibits the formation of exoskeleton of insects), azadirachtin (extracts from neem tree), Petroleum Spray Oils (volck oil (PSOs, or horticultural mineral oils, M-pede (potassium salts of naturally derived fatty acids), and others.

Our last year results (Journal of Agricultural Sciences, 2014: 6: 1–9) showed that Diflubenzuron (dimilin) was effective in controlling the damage caused by wheat stem sawfly (Cephus cinctus) larvae compared to the treatment with water spray only and the untreated control.

Dimilin kills insects by interfering with chitin synthesis and disrupting insect growth. Dimilin has been shown to be effective in controlling larvae of many insect species.

In addition, treatment with azadirachtin showed significantly lower stem damage and fewer wheat stem sawfly larvae compared to the untreated control and treatment with water spray alone.

Neem extracts are reported to affect over 600 species of pests and it has been suggested that the neem has the potential to be used as a good alternative to conventional insecticides in IPM programs. In our study at WTARC, azadirachtin effectively suppressed C. cinctus populations.

Our another study in canola field (Journal of Economic Entomology, 2014, 107: 661-666) indicated that the Petroleum Spray Oils

are effective in reducing flea beetle damage levels and increasing crop yield of canola compared to the control.

Because of their low toxicity to natural enemies and safety to the environment, PSOs are IPM-compatible pest control compounds. However, there has been no practical work done using Petroleum Spray Oils for the control of flea beetles.

PSOs, because of their short-term residual activity, do not severely affect populations of beneficial arthropods, although predators and parasites may be killed on contact when sprayed directly.

Also, azadirachtin also had some effect in controlling flea beetles. Neem biopesticides may, therefore, be well suited for inclusion in IPM programs.

Similarly, M-Pede was more or less as effective as the neem treatment. M-Pede is commercially available and could be a good low risk insecticide for the control of insects.