

Integrated Pest Management



Integrated Pest Management (IPM) With Single Active Ingredient Insecticides.

Good IPM principles should always drive product choice so you benefit from applying the right product to the target pest at the right timing. Single AI products can help you manage your fields easily, economically and with the scientific backing of IPM best practices.

If you're considering replacing your single active ingredient (AI) products, such as Coragen® insect control and Prevathon® insect control powered by Rynaxypyr® active, Exirel® insect control powered by Cyazypyr® active, Steward® EC insecticide or Carbine® 50WG insecticide, with less expensive premix products of similar chemistries, you may want to choose wisely. Many growers discover too late the outsized hidden costs of saving money up front with premix alternatives: more applications, more money, reduced flexibility, mite flares and pest resistance in the long run.



Quick Facts

- **Disruption of beneficial insects.** Taking out natural predators and parasitoids sets the stage for costly mite, aphid and scale infestations down the line.
- **Risk to pollinators.** Unlike most premixes that contain other IRAC MOA chemistries, the single diamide AI contained in Rynaxypyr active insect control products has been shown to have minimal impact on key pollinators once residues dry!¹
- **Resistance development.** Premixes that have active ingredients with different knockdown and residual control characteristics can result in only one component doing the heavy lifting, while the other is exposing pests to sub-lethal doses that allow only resistant pests to survive, speeding up the development of resistance. Furthermore, if resistance is already suspected to occur in one of the components in a premix, the premix will be less effective. To avoid resistance and reserve the right chemistry for the right timing of the season, use single AI products and rotate MOAs.
- **Pesticide residues.** Premix products can result in additional AI residues as key export markets are placing increased pressure on growers to reduce or eliminate detectable residues.
- **Worker Protection Standard.** Premix products that contain the diamide Group 28 chlorantraniliprole or cyantraniliprole usually carry a more restrictive signal word which requires more careful handling, additional personal protective equipment, longer re-entry intervals (REI) and/or extended vs. the single MOA diamides preharvest intervals (PHI).

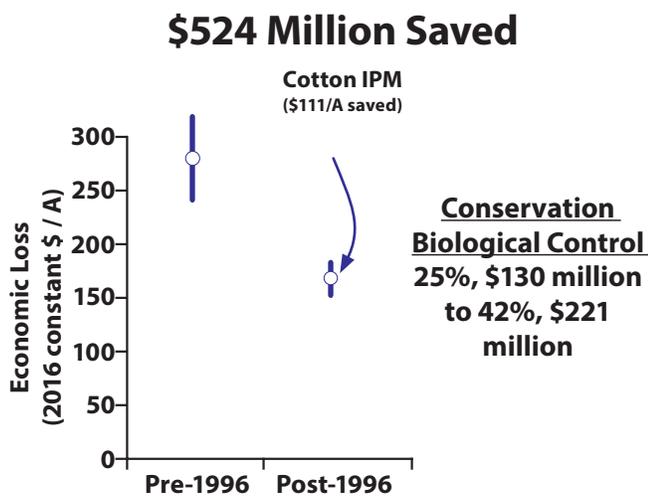
¹Refer to label for specific use directions to protect bees and other insect pollinators.

Financial Benefits of Conserving Beneficial Insects

A University of Arizona study reported that since 1996, Arizona cotton growers have saved at least \$524 million through the 2016 cotton season, or ca. \$111/A / year*. The University of Arizona believes that based on this analysis, up to \$221M or 42% of the savings were due to the conservations biological control enabled by the improved IPM Programs.

This estimate does not attempt to incorporate the additional benefits of preserving an economy and culture that may not have been possible if not for the advances made at the time. It also provides a low-end estimate because Pima cotton was included at upland cotton prices, which are considerably lower.

*Inclusive of costs to the grower of Bt trait technologies.

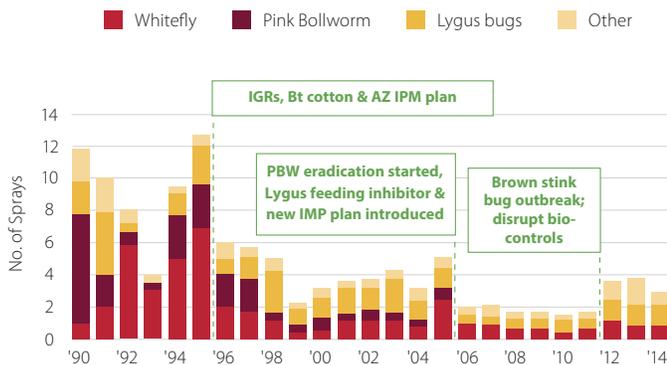


1990-1995 v. 2006-2016. The University of Arizona. Peter C. Ellsworth.

New Research & Trends in Cotton Insect Control

Resurgence of Broad Spectrums

May 9, 2018



Always read and follow all label directions, restrictions and precautions for use. Some products may not be registered for use or sale in all states. As of November 1, 2017, the USEPA registrations for DuPont™ Coragen® insect control, DuPont™ Prevathon® insect control, Exirel® insect control, Steward® EC insecticide and Cyazypyr® and Rynaxypyr® actives have been sold to FMC by DuPont. FMC, Coragen, Cyazypyr, Exirel, Prevathon, Rynaxypyr and Steward are trademarks of FMC Corporation or an affiliate. Carbine is a trademark of Ishihara Sangyo Kaisha Ltd. ©2018 FMC Corporation. All rights reserved. 18-FMC-1121 06/18

INSECT RESISTANCE MANAGEMENT PRINCIPLES

RIGHT CHEMISTRY	Select highly effective products. Avoid broad-spectrum and premix insecticides when Als do not fit pests present.
RIGHT RATE	Use the most effective labeled rate, avoiding underdosing. Calibrate equipment and obtain thorough coverage. Follow local crop advisor and university recommendations.
RIGHT TIMING	Target early, vulnerable pest life stages. Do not expose multiple, consecutive insect generations. Adhere to maximum number of applications per season.
RIGHT ROTATION	Rotate MOA using a treatment window that targets each generation with a single MOA and rotate to an alternative MOA for the subsequent treatment window/generation.
GOOD IPM	Employ multiple tactics: - Cultural control including proper plant fertility. - Biological control and beneficial insect conservation or preservation. - Mating disruption. - Host plant resistance.

Insect Resistance Management Reminders

Avoid using the same MOA on consecutive generations of the same insect.

Sequential applications of the same MOA are acceptable when targeting the same generation of an insect. Do not apply more than twice to the same generation of insect.

