COTTON BROAD SPECTRUM

Broad Spectrums

Lbs/ac

No. of Sprays

'91 '95 '99 '03 '07 '11

'91 '95 '99 '03 '07 '11

Cotton broad-spectrum insecticides have been reduced from a high of 12 sprays (> 4 lbs ai) per acre (1995) to a fraction of a spray (< 1 lb ai) per acre. Declines occurred after 1996 following introduction of bt cotton, whitefly IGRs and dissemination of a new IPM plan. Declines since 2006 are attributed to a pink bollworm eradication program and a new reduced-risk LYGV feeding inhibitor (Folicamid), which conserves natural enemies.

LETTUCE BROAD SPECTRUM

Broad Spectrums

Lbs/ac

No. of Sprays

'91 '95 '99 '03 '07 '11

'91 '95 '99 '03 '07 '11

Let us analyze the data for Arizona cotton and lettuce and charted 22-year trend for major chemicals. Overall results show a dramatic reduction in the use of broad-spectrum insecticides and an increase in adoption and use of selective chemicals that help maintain natural enemy populations and reduce risk to human health and the environment.

COTTON TRANSITION TO REDUCED RISK CHEMISTRIES

Reduced-risk

No. of Sprays

'91 '95 '99 '03 '07 '11

Reduced-Risk

No. of Sprays

'91 '95 '99 '03 '07 '11

Adoption and use of reduced-risk chemistries for insect management in cotton have increased since the introduction of the first products in 1996. Many products in this category also preserve natural enemies of key pests in the cotton system, reducing the need for follow-up sprays.

LETTUCE TRANSITION TO REDUCED RISK CHEMISTRIES

Reduced-Risk

Lbs/ac

No. of Sprays

'91 '95 '99 '03 '07 '11

Reduced-Risk

Lbs/ac

No. of Sprays

'91 '95 '99 '03 '07 '11

The use of reduced-risk insecticides in lettuce has increased since the introduction of the first products in 1996. Availability of novel and multiple chemistries help producers reduce the risk of insecticide resistance.

OVERVIEW

IPM programs seek to optimize pesticide use as a part of a broader strategy to manage pests while minimizing risk to non-target organisms, people and the environment. In many systems for insect management, this optimization may lead to a reduction in overall pesticide use and/or a shift from broad-spectrum compounds to more targeted reduced-risk chemistries. Long-term changes in pesticide use patterns provide one barometer to examine progress in IPM implementation. However, it is often difficult to assess changes in pesticide use due to a lack of available data. The Arizona Pest Management Center (APMC) has invested significant resources into IPM assessment. This includes user surveys conducted as part of the Crop Pest Losses and Impact Assessment Work Group (see poster # P51) and development of the APMC Pesticide Use Database (present poster), which contains 17 years of state pesticide use reports for agricultural crops.

We analyzed insecticide use data for Arizona cotton and lettuce and charted 22-year trend for major chemicals. Overall results show a dramatic reduction in the use of broad-spectrum insecticides and an increase in adoption and use of selective chemicals that help maintain natural enemy populations and reduce risk to human health and the environment.

CONSTATNS

The APMC Pesticide Use Database contains all reported statewide agricultural pesticide uses 1991-2011. Reporting is required for all custom (for hire) and aerial applications, Section 18 exemptions, and products listed on Arizona Department of Environmental Quality’s Groundwater Protection List. Our database does not provide a complete picture of use for all pesticides. However, many types of insecticides are typically custom applied and are well represented in the data. Furthermore, the same types of applications have been reported across all years, so this dataset provides a valid resource for examining long-term trends.

ACKNOWLEDGMENTS

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These reduced-risk chemistries are now important tools in cotton IPM. Whitefly IGRs (pyriproxyfen & buprofezin) are selective against whitefly nymphs. Neonicotinoids are partially selective against whiteflies. The ketoenol class (only spinosyn in cotton) is used for whitefly management. Folicamid is a feeding inhibitor selective against Lygus bug.

Imidacloprid played a critical role in recovery of fall lettuce following invasive whitefly outbreaks (mid 90s) and, with other neonicotinoids, remains important against aphids & whiteflies. The ketoenols include spinosyns, used for whitefly control, and spirotetratran, used against whiteflies and aphids. Diamides help control lepidopterans and spinosyns a variety of pests.