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Industry intensifies cotton insect resistance battle

Exclusively for Delta Farm Press

Insecticide Resistance Action Committee, an organization of leading agrichemical companies, is intensifying efforts to assist U.S. cotton growers confronted with insecticide resistance problems.

"Insecticides we have depended on in the past are experiencing significant performance problems in some areas or are being phased out," says Charles Staetz, FMC Corp., Princeton, N.J. "The loss of conventional products places tremendous selection pressure on the few new products being introduced. Cotton growers are simply running out of ammunition and additional replacements will be needed to fill the gap."

Staetz is chairman of the global IRAC, a specialized group formed by the industry in 1984 to assess the threat of insecticide resistance and develop solutions.

He points out that resistance to organophosphates, pyrethroids and carbamates — some of which have been in use on U.S. cotton farms for as long as 30 years — is becoming widespread. At the same time, the pace of insecticide registration and re-registration has slowed dramatically at the U.S. Environmental Protection Agency.

"The situation is critical and IRAC is intensifying efforts to help cotton growers regain the upper hand in the battle against destructive insects," Staetz says. "Companies with U.S. operations have become concerned enough to form an IRAC U.S. to target research and education in the United States."

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IRAC U.S. member companies include Abbott Laboratories, AgrEvo, American Cyanamid, BASF Agricultural Products, Bayer Corp., Novartis Crop Protection, Cotton Incorporated, DowAgroSciences, DuPont, Elf Atochem, FMC Corp., Gowan Co., Monsanto, National Cotton Council, Rhone-Poulenc, Rohm & Haas, Uniroyal Chemical Co., Valent and Zeneca.

Composed of leading entomological experts, IRAC and regional IRAC groups act through a number of committees representing each major crop and insecticide group where resistance problems occur.

The key mission of IRAC is to develop resistance management strategies providing guidance that will enable growers to use crop protection products in a way that will maintain the efficacy of these products. The organization is implementing a comprehensive strategy to confront the growing dilemma of insecticide resistance:

- Identify the scope of resistance problems through surveys;
- Develop methods for detecting and monitoring resistance;
- Discover how resistance occurs;
- Devise programs to counter the loss of pest susceptibility;
- Develop susceptibility management strategies which incorporate all practical pest management methods into a crop management program;
- Disseminate information on management strategies; and
- Interact with regulatory authorities responsible for insecticide registration.

"Insecticide resistance is an issue that is not going to go away, so it's imperative that growers, agrichemical companies and land grant universities speak with one voice on this subject," says Ray McAllister, director of regulatory affairs for the American Crop Protection Association, Washington, D.C. "The members of IRAC are offering a valuable service to U.S. agriculture by investing in new products and helping us defend those already in use."

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Grower awareness is a major key to winning the battle against insecticide resistance in lint production, according to Pat O'Leary, director of agricultural research for Cotton Incorporated, Raleigh, N.C.

"No matter what we discover about resistance, it will be of little value unless the end-user is actively engaged in implementing effective control and prevention plans," she says. "What you apply and when you apply it is right at the cutting edge of this problem. Also, alternative measures need to be considered and employed."

IRAC recommends that growers try to minimize insecticide application by employing these alternative measures:

- Monitor fields through scouting to determine pest populations and trends, as well as presence of beneficial insects;
- Use insecticides only if target pests are numerous enough to cause economic losses greater than the cost of the materials plus application; and
- Take an integrated approach to pest management, combining as many different control mechanisms as possible, such as protection of beneficials, rotation of insecticide classes, use of transgenic crop varieties and crop rotation.

"Cotton has been one of the crops hardest hit by resistance problems, and a major initiative is underway to contain this problem," says Timothy Dennehy, extension specialist and professor of entomology, University of Arizona, Tucson.

Dennehy has spearheaded efforts to control resistant whitefly, which has cost Arizona cotton growers up to $15 million a year. Resistance to certain insecticides also is causing problems for U.S. growers with aphids, plantbugs, lygus, bollworms, tobacco budworms and armyworms.

"We have registered progress on all fronts through a team effort involving extension and research, producer groups and industry. IRAC is the central resistance control outreach of industry and it plays an integral role in this campaign," Dennehy says.

In addition to cotton, IRAC commodity units are working to minimize insecticide resistance in rice, fruit crops, field crops and vegetables. The committee network also includes groups specializing in stored products, public health and vectors, pyrethroid efficacy and Bt management.

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