STEWARD- A NEW CONTROL AGENT FOR TARNISHED PLANT BUG AND COTTON FLEAHOPPER

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Slide: 1 (Title & Introduction)

Good afternoon! On behalf of DuPont Agricultural Products it's a pleasure to be with you. I'd like to spend a few minutes this afternoon reviewing the performance of our new cotton insecticide, Steward™ on tarnished plant bug and cotton fleahopper. Steward™, formerly DPX-MP062 was accepted as a reduced risk candidate and granted expedited review by the Environmental Protection Agency in February of '98. This new insect control agent controls all major worm pests in cotton plus selected sucking insect pests while conserving beneficials and offering a high degree of safety to mammals.

Slide: 2 (Mode of Action)

The route of entry into target insects is through ingestion of treated foliage and absorption through the cuticle. Once inside the insect Steward's novel mode of action acts to inhibit sodium ion entry into nerve cells. The blockage of these sodium channels in insects leads to poor coordination, paralysis and ultimately death. Insect exposure to a toxic dose of Steward™ results in a rapid cessation of feeding, generally within 1-4 hours. Pest knockdown occurs within 1-2 days of exposure. Extensive laboratory and field studies have demonstrated good activity on insects resistant to a broad range of commercially available products, thus making Steward™ an excellent tool in IPM and resistance management programs.

Slide: 3 (Toxicology)

Steward™ has an excellent toxicological and ecotoxicological profile. As you can see from this slide mammalian toxicity is relatively low. This characteristic will provide workers, terrestrial mammals, birds and aquatic organisms with improved margins of safety, particularly when compared to OP's and carbamates.

Slide: 4 (Tarnished Plant Bug Overview)

Tarnished plant bugs have become a major insect problem in much of the cotton belt, resulting in an estimated crop loss of 1.6 % annually in cotton. Lygus bugs overwinter as adults in ground trash and fall hosts. The insects complete one or more generations in spring hosts such as vetch, clover, primrose, and curly dock prior to moving into cotton. They initially infest the field margins and eventually migrate across the entire cotton field. Implementation of control measures vary depending on fruit retention, yield potential, and environmental conditions. Consistent control of tarnished plant bug has proved difficult due to the uneven distribution, mobility, and reinfestation potential of the pest.

Slide: 5 Tarnished Plant Bug Results

Early in the development of Steward™ we had strong indications that the compound offered more than just control of lepidoptera. Spray chamber tests were conducted by Dr. Glynn Tillman, USDA, Tifton, Georgia in 1997 to determine both contact and residual activity of Steward™ on tarnished plant bug adults. This initial work confirmed early field observations. Results from these laboratory studies indicated that topical applications of Steward™ at rates of 0.09 to 0.11 pounds active per acre provided 82% to 86 % adult tarnished plant bug mortality at 48 hours after treatment. Dr Tillman's work also demonstrated that tarnished plant bugs exposed to dry residue were less susceptible than those receiving topical applications.

Slide: 6 Inhouse TPB Studies '97 thru '98

Nine field trials were conducted by DuPont development across the south in 1998 and 1999, at rates of 0.09 to 0.11 pounds active per acre. Steward™ at these rates provided 63 to 84 % control of tarnished plant bug adults at three to four days after treatment. Pest were evaluated using sweep net samples. The data in this slide is expressed as percent control. Steward™ at these rates provided superior control when compared to standards such as Vydate-CLV, Karate and Orthene.

Slide: 7-University TPB Studies

Field trials conducted by university investigators confirm a similar trend. Based on eight university studies installed over a three year period Steward™ at 0.09 and 0.11 pounds active per acre resulted in 75 and 76% control of adult tarnished plant bug. The standard, Orthene at 0.50 lbs.ai./ac resulted in a control rating of 72%.

Slide: 8 -W. Scott TPB Study

Dr. William Scott with the United States Department of Agriculture in Stoneville, Mississippi installed a large block replicated study this summer comparing both new and standard insecticides in the control of tarnished plant bug. The plots were sixty feet by sixteen rows , replicated three times. Applications were made using a John Deere 6000 highboy. Five applications were made on a 5-7 day schedule. The numbers represent total plant bugs, both adults and nymphs. Two methods of sampling were employed. That

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being sweep net counts and drop cloth counts. The results are an average of seven evaluations. As you can see steward at 0.09 & 0.11 pounds active per acre provided control equal to or greater than commercial standards.

Slide: 9 - C. Allen TPB Study

This data comes from Dr. Charles Allen with the University of Arkansas and is an average of two studies which were initiated in 1998. As you can see Steward™ at 0.09 and 0.11 pounds active per acre provided control of tarnished plant bug adults and nymphs greater than the commercial standard.

Slide: 10 - S. Stewart-Jack Reed TPB Study

This study was initiated by Dr. Scott Stewart and Dr. Jack Reed at Mississippi State University. The data represents total tarnished plant bug adults and nymphs per 100 feet of row. Sampling was done using a standard 3 foot drop cloth. In this study Steward™ at 0.09 and 0.11 pounds active per acre provided control greater than all treatments except Bidrin.

Slide: 11 Cotton Fleahopper Overview

The cotton fleahopper is an important pest of cotton, particularly in parts of the southeast and texas. The Fleahopper injures cotton with its piercing/sucking mouthparts by puncturing and feeding on terminal buds and newly formed squares.

Slide: 12 Cotton Fleahopper Data:

Steward™ has demonstrated good to excellent performance on cotton fleahopper. This slide is a summary of 1998 data from the Southwest. As you can see Steward™ at rates of 0.09 to 0.11 pounds active per acre gave control equivalent to the standard.

Slide: 13 Proposed Label Wording:

Tarnished plant bug and cotton fleahopper will be labeled at a rate range of 0.09 to 0.11 pounds active per acre. The label will state "a single application of Steward™ will provide control of light to moderate populations of tarnished plant bug and cotton fleahopper. Heavy populations may require multiple applications."

Slide: 14 (Summary)

In summary the following key points can be made:

- Steward™ will offer the cotton grower broad spectrum worm, tarnished plant bug and cotton fleahopper control.
- Steward™ will have low impact on most beneficial predators and parasites.
- Low toxicity to users and non-target organisms.
- Steward™ will be an excellent tool for use in IPM and resistance management programs with its unique mode of action.

Slide: 15 (Thank You)

The development of Steward™ began seven years ago. We at DuPont would like to express our gratitude to all of those involved in the development of this unique product. To the University researchers, regulatory people, contract researchers and to the cotton producers who allowed us to work on their farms, thank you!

Slide: 16 (Closing)

DuPont's commitment to the cotton industry remains strong. It began in the 1950's with the registration of Karmex and continued on with the registration of such products as Vydate-CLV, Lannate, Asana and most recently Staple. We believe Steward™ will provide cotton growers with an important new tool, and do so in an environmentally friendly way.