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**PROGRESS REPORT
TO
NORTH CAROLINA PEANUT GROWERS ASSOCIATION, INC.**

TITLE: Evaluating Chlorpyrifos Failures in NC Peanut Fields and Seeking Cost Effective Alternatives

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REPORT:

Peanuts have a long history in North Carolina and all through the years, there have been a lot of pests associated with their production. Some problems come and go and are not consistent concerns. In the insect world, these would include fall armyworms and lesser cornstalk borers. These potentially serious pests, yet sporadic in their occurrence vary in the impact they have each year. One pest that has been a concern for decades, even though it is sporadic in occurrence is the southern corn rootworm. This soil insect pest is typically a greater concern in the heavier soils, but in wet summers can cause damage in even the lightest soils. The larval stage of the beetle feeds directly on pods and pegs and therefore the damage is quite severe and can significantly reduce yield and quality.

An indexing system that helps identify fields at risk to pod damage should allow you to decrease preventive insecticide treatments for southern corn rootworm. By assigning a number value to factors that correlate with pod damage, you will have a more accurate estimate of risk for a particular field. These factors include: cultivar resistance, planting date, field history of rootworm damage, soil texture, and soil drainage. The Southern Corn Rootworm Advisory for Peanut Pod Damage in North Carolina and Virginia can be found online at <http://ipm.ncsu.edu/scr/>. This advisory helps avoid unnecessary insecticide applications in fields not likely to suffer from rootworm infestations.

The control of soil insect pests, primarily southern corn rootworm, has been accomplished through the use of primarily one product. Lorsban (chlorpyrifos) has been used for decades and proven to be very effective in protecting developing pods from damage due to wireworm, cutworm, and lesser cornstalk borer, however, in North Carolina, the primary soil pest has been southern corn rootworm. During the past five years we have received reports and observed situations of apparent product failure despite proper application. During 2006, 2007, and 2008 we (in collaboration with Dr. Ames Herbert at Virginia Tech) collected data that does indeed indicate a failure of the product to perform up to standards, but we've also observed that the use of chlorpyrifos at an increased rate or multiple applications did not prevent pod damage. Some trials indicate a complete failure of Lorsban to provide protection of developing and mature pods from insect damage in isolated fields. We also found that the higher the rates and variations in timing not only failed in some locations, but often resulted in greater insect damage and lower the yield.

These results are a concern, even though they have been documented in isolated area. Chlorpyrifos has been the standard for rootworm control and we have very few options available. We initiated trials to further investigate the cases where chlorpyrifos does not appear to work and look into alternatives for rootworms management with different classes of

insecticides. Our research plans in 2009 occurred in farmers' fields in Perquimans County in a location that has suffered poor performance from chlorpyrifos in recent years. In addition, a similar trial was conducted at the Peanut Belt Research Station in Lewiston, NC. The two "high risk" sites included replicated plots treated with Lorsban at 1X and 2X rates in June (flowering) or July (pegging) and both June and July. In addition, we evaluated applications of bifenthrin granules at two application rates, a bifenthrin spray, and a zeta-cypermethrin+bifenthrin treatment to study the efficacy and cost effectiveness of these proposed alternative treatments when applied in June and July. One hundred pods were collected per plot prior to harvest and examined for pod damage. Yield data was also collected from each plot.

The results of our trials indicate that chlorpyrifos performance was sporadic in 2009. We are particularly interested in the relatively poor performance at the Peanut Belt Research Station in Lewiston. This is the first time we observed less than stellar performance on the station. We had previously suspected that problems with chlorpyrifos performance were isolated to a few fields with specific soil types, but these results make us more concerned. We actually got better control at the Perquimans site where we have observed poor control in the past as compared to the Bertie (Lewiston) trial. There is some indication that alternative products may be useful for southern corn rootworm control, but this must be studied with more trials over a wider range of conditions. The variability of control for chlorpyrifos is an area that we will continue to monitor and study for means to improve.

IMPACT STATEMENT

This research is helping peanut farmers in North Carolina and Virginia make educated decisions about southern corn rootworm control and to be more selective in crop rotation programs and pesticide selection. In addition, this research is investigating cost effective alternatives to avoid the insecticide failures that have been observed in peanuts.