NORTH GEORGIA APPLE INTEGRATED PEST MANAGEMENT PROGRAM IMPROVES PRODUCERS' CONFIDENCE

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Background

Producing apples in the north Georgia area has been practiced for at least 150 years. The relatively cool summers and abundant rainfall of the region makes it ideal for pome fruit production. In addition, north Georgia apple producers begin harvest in mid-August, which puts them first to supply their produce on the wholesale apple market. Beginning in the late 1980's, the number of apple producers has fallen by almost 90% due to the advent of controlled atmosphere storage technologies and significant changes to the pesticides available for commercial pome fruit production. Due to these changes in the fruit industry, many producers have chosen to retire from apple production. Many use the old orchard sites for cattle or poultry production, or sell their land as the price of land in north Georgia has increased. As the early season market advantage slipped away from north Georgia, the remaining producers have chosen to focus upon the retail, roadside market. As of today, roughly 95% of the apples produced in the region are sold at the retail level. In addition, a significant evolution in labeled pesticides for pome fruits has also occurred.   The remaining producers have adapted their marketing strategies to the new retail market. These producers have also improved their ability to make decisions in the orchard by embracing IPM concepts.

The use of apple IPM in north Georgia is not intended to replace how the producers make day-to-day management decisions about their orchards. If desired, producers take what the program is indicating and incorporate the information into their management decision making process. Overall, the apple IPM program has improved the relationship between the county agents of Gilmer and Fannin Counties and the apple producers. This program has reduced communication gaps between the county agents and the producers. The producers now have a higher level of confidence with UGA Cooperative Extension as a source of vital and relevant information.

North Georgia Apple IPM Program

In 2003, the current apple IPM program was developed. From the beginning of the program, disease and insect management were the main focuses of the program. The bacterial disease, fire blight, *Erwinia amylovora*, is very common in Southeastern orchards. If not properly controlled, it could devastate Southeastern apple production. Degree-day models have been developed for three main insect pests of apple (NCSU AG-572). These models allow producers to track the life stages of each insect throughout the growing season. Oriental fruit moth, *Grapholitha molesta* Busck, codling moth, *Laspeyresia pomonella* (L), and tufted apple budmoth, *Platynoda idaeusalis* are the three insects that are targeted by the IPM program. To assist in data collection, an apple scout was recruited and funded by the participating producers. Insect trapping supplies were bought by the producers in bulk, which saved them approximately 30% of the cost of the supplies. In addition to farm visits and phone calls, communication between the producers and the county agents is accomplished through two main sources, a newsletter and a website.

The largest issue with fire blight control is predicting the initial preventative, antibiotic spray. The accumulation and spread of the fire blight bacterium in an orchard is highly

dependent upon the weather conditions during bloom (Smith, 2002; Steiner and Lightner, 1996). Warm, rainy conditions, which define Southeastern growing conditions, are ideal for the spread of the disease. The county agents of the IPM region use fire blight prediction models to predict the initial onset of the disease. The tools used to predict fire blight are *Cougarblight* and *Maryblyt* (Smith, 2002; Steiner and Lightner, 1996). Both of these programs use weather conditions and other risk factors to track the potential growth of the disease in the orchards. When conditions are ideal for a fire blight infection, these programs will prompt the producers to spray a protective antibiotic to reduce the chances of an infection. Once the initial spray has been timed, many of the producers are able to rely upon their own level of experience to continue with an antibiotic spray program throughout the bloom period. Every year, the timing of the initial spray has been the most challenging aspect of controlling fire blight in north Georgia orchards.

A pheromone based trapping program is used throughout the growing season to monitor the population levels of Oriental fruit moth, codling moth and tufted apple budmoth (NCSU AG-572). Traps for each insect are set in early spring and are used to set a biofix date for each insect species. The biofix is determined when a sustained catch of the male moths is observed. In general, biofix dates for an insect are within a week to 10 days of each other depending upon a given orchard's history and location (NCSU AG-572). A decision to spray is based upon weekly insect trap counts and the use of the degree-day model for that particular insect, which helps to predict adult emergence or percentage of egg hatch. These models are critical because they allow the producers to make an insecticide application that will target the particular species when the adult or larvae populations are at their highest and most vulnerable.

Program Communication and Funding

A periodic newsletter is released to the producers and specialists involved in the program throughout the growing season. The newsletter, written by the author, summarizes conditions across the region, and suggests management scenarios for the producers. The North Georgia Apple IPM website, http://newsletters.ces.uga.edu/ngapples, is the primary source of information to the producers and specialists. All of the insect trap count data and degree-day information is available on the website. This conveniently allows producers to compare the current year to past years. In addition, all newsletters are archived on the website for collective data comparisons. The current season's fire blight risk data is posted to the website as well. The most significant aspect about the website is the dissemination of information between the author and specialists at the University of Georgia. As a consequence, this allows a more efficient response to the needs of the apple producers by University of Georgia Cooperative Extension.

In 2005, the IPM program picked up partial funding from the Upper Coosawattee Watershed 319 Program. The 319 program, which received funding through the Georgia Environmental Protection Division, and administered by Georgia Soil and Water Conservation Commission, Limestone Valley District, has paid the apple scout's time and travel from 2005 through 2008. Trapping supplies are still paid for by the participating producers. With the funding from the 319 program, which is focused on reducing nutrient-loading from agricultural practices within the Upper Coosawattee Watershed, the apple IPM program expanded its scope to include orchard nutrient management. A mid-season leaf and soil sampling regime was incorporated into the program. This has allowed the producers to monitor the nutrient status of the trees and overall soil productivity.

Orchard Nutrient Management

Since the soil and leaf samples have been tested year after year, producers have tracked changes of the nutrient status of their orchards, and make critical changes to their nutrient management programs. For many of the orchards, soil pH has been continually low, which is partially due to their disease management spray programs. The low soil pH has affected the availability and concentration of certain key elements such as calcium and potassium in the soil and within the trees. Many summer rots, like bitter rot are less likely to affect the tree's overall health if these elements are at adequate levels within the tree. In addition, the nutrient management program has revealed that many of the orchards are high in nitrogen within the tree. With this new insight to the nutrient status of the trees, many producers have restructured their fertilization program. Many have shifted focus away from nitrogen fertilization to maintaining the proper soil pH and adding more calcium and potassium in their orchards.

Summary

The North Georgia Apple IPM Program has been serving the north Georgia apple producers since 2003 with 70% of the region's producers participating, which represents 98% of the region's acreage. In a recent survey of the producers, 91% said the IPM program is worth the effort. In their opinion, the program gives them the ability to better time pesticide applications in the orchard. Also, it gives the producers a stronger degree of confidence in the effectiveness of the pesticide applications. The use of either the fire blight prediction models or the insect degree-day models, coupled with the apple scout's weekly collect insect count data has greatly contributed to this improved confidence. Beginning in 2009, the 319 program will no longer support the IPM program. When asked whether or not the producers themselves were willing to pay for the apple scout's travel and time to maintain and collect data from the traps beginning in 2009, 88% of the producers responded they are willing to pay the scout in order to continue the IPM program. This response confirms the success of the program and solidifies the relationship between Extension and the producers.

References
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