

## Fungicides & Insecticides With Top-Dress Nitrogen: 2009 Test Results

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Two cornerstones of IPM are the use of scouting and threshold-based applications of pesticides. In North Carolina, we have thresholds to guide pesticide applications in wheat for powdery mildew, leaf rust, *Stagonospora nodorum* blotch, and cereal leaf beetle (CLB). These pests usually become problematic in April or May when growers are busy with other crops, and when driving over wheat to apply a pesticide causes yield reductions. It would be more convenient if fungicides or insecticides could be applied with top-dress N in early March. Additionally, several fungicide manufacturers report yield increases due to improved “plant health” associated with an early March application. In 2008-2009, we conducted tests in each major wheat production region of North Carolina to determine if early March applications of pyrethroid insecticides and/or strobilurin fungicides would increase yield in the presence or absence of pest pressure.

### Tidewater Region - Plymouth NC

This was a seven-replication test using Pioneer 26R12 with 3 treatments: (1) early-March application of Warrior (0.02 ai/acre) plus Headline (9 oz/acre), (2) IPM, with pesticides only applied if a disease or insect was over threshold, and (3) an unsprayed check. Because disease levels were very low, a fungicide was not applied in the IPM treatment. Cereal leaf beetle eggs and larvae on April 16<sup>th</sup> were well above threshold (Figure 1, dotted line) in all treatments. Warrior (0.02 ai/acre) was applied to the IPM plots. Sampling again on April 22<sup>nd</sup>, CLB larvae in the IPM plots had been reduced to 0.0, compared to 102 larvae per 100 tillers in the early-March treatment. Crop yield was highest in the IPM treatment, followed by the early-March application, and lowest in the unsprayed check plots. There was no treatment impact on test weight. **In this test, the early-March application of Warrior did not provide adequate CLB control.**

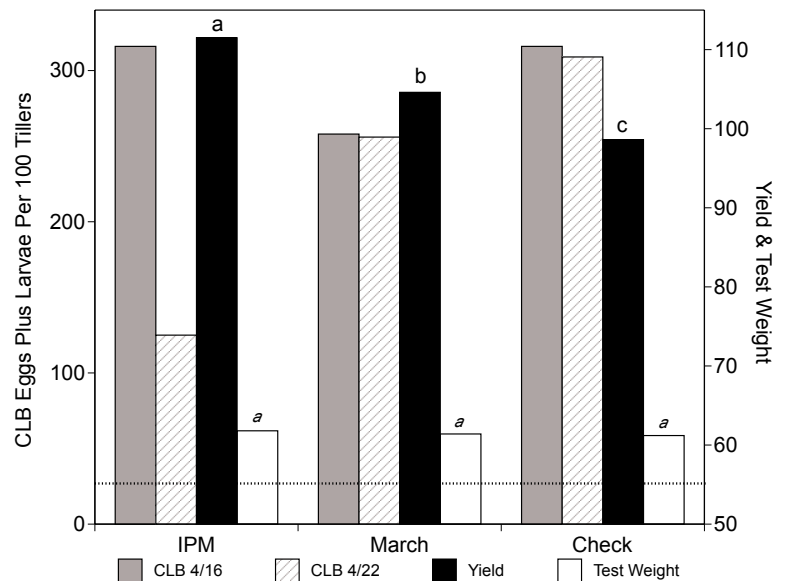


Fig 1. Cereal leaf beetle, yield, and test weight at Plymouth NC.

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### Coastal Plains Region - Kinston NC

The same design, treatments, and variety were used as in Plymouth. Disease levels were low so a fungicide was not applied in the IPM treatment. CLB on April 17<sup>th</sup> were over threshold in the IPM and check plots (Figure 2). The early-March insecticide had controlled CLB. The IPM plots were sprayed with Warrior and re-sampled on April 27<sup>th</sup>; the CLB population was reduced. However, the CLB population in the check plots had also dropped below threshold. **Apparently factors other than our treatments reduced CLB populations, making all insecticide application unnecessary.** Yield and test weight were not different across treatments.

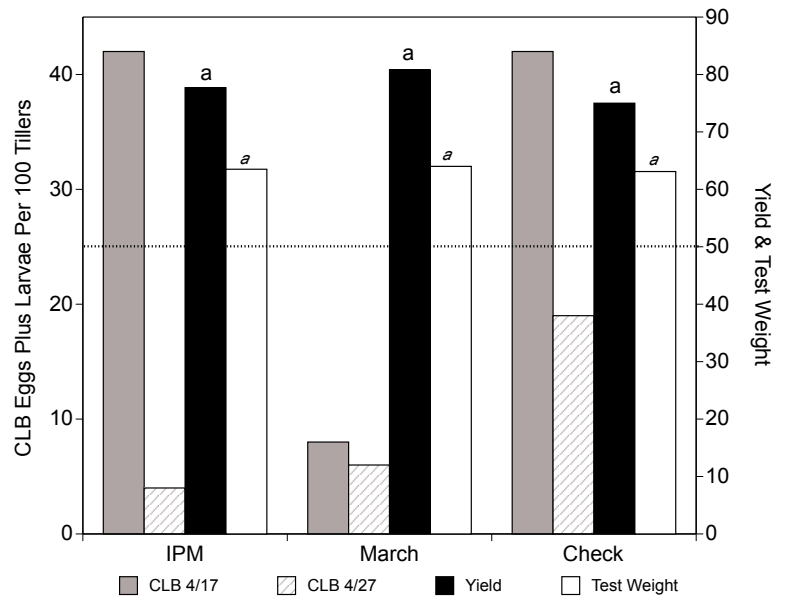


Fig 2. Cereal leaf beetle, yield, and test weight at Kinston NC.

### Central Piedmont Region - Salisbury NC

This was the same design as in Plymouth and Kinston but with 6 replications. However, the test consisted of a long strip of Roane with grass on one side and different wheat varieties and/or barley on the other, so the plot-to-plot variability in yield was large. The CLB population sampled on April 27<sup>th</sup> was very low and never developed any further (Figure 3). Disease levels were also well below threshold. Consequently, the IPM treatment was never sprayed. There were no statistical differences between treatments for yield or test weight.

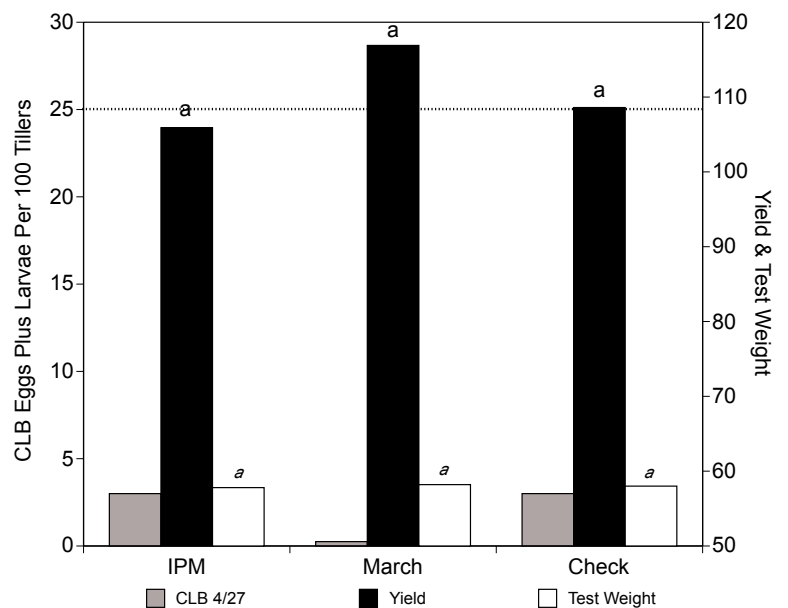


Fig 3. Cereal leaf beetle, yield, and test weight at Salisbury NC.

In May, the early-March fungicide-plus-insecticide treatment was noticeably greener and looked like it would yield better than the other treatments. This seemed to support the idea that a strobilurin fungicide application had improved “plant health” even in the absence of disease. **However, neither a yield or test-weight increase was observed at harvest.**

## Southern Piedmont Region - Monroe NC

There were two tests near Monroe NC, one with Coker 9436 and the second with DynaGro Tribute. Treatments were replicated 4 times and included: (1) early-March applications of Baythroid at 1.08 oz/acre, Quadris at 10.8 oz/acre, Quadris at 6 oz/acre, Quilt at 14 oz/acre, or Tilt at 4 oz/acre; (2) two IPM treatments; and (3) an unsprayed check. Foliar diseases and CLB never

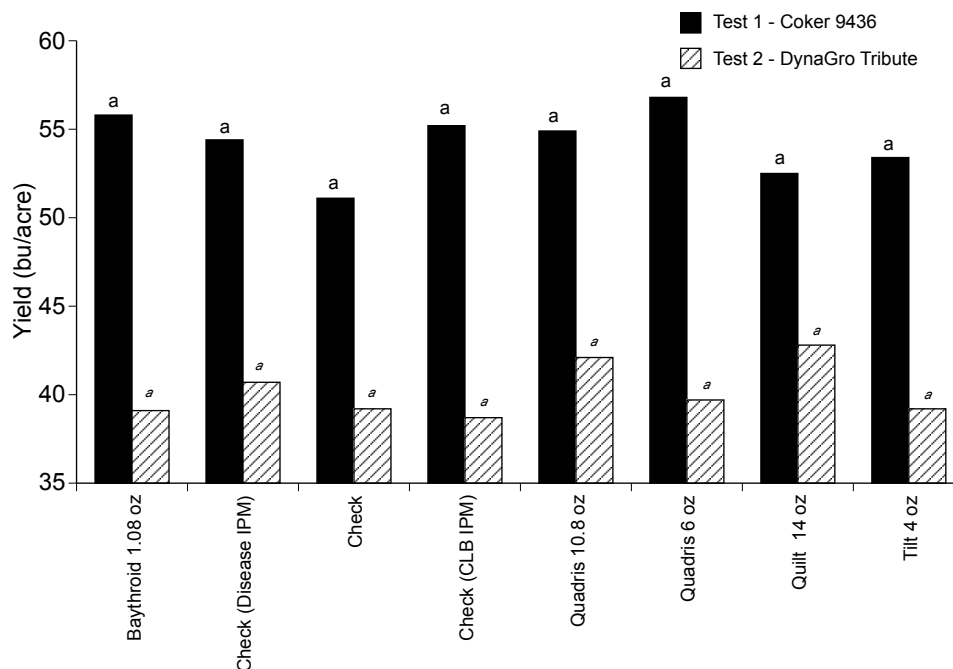


Fig 4. Yield in two tests near Monroe NC with eight treatments.

reached thresholds, and the two IPM treatments were not sprayed. **At each location, there were no differences in yield or test weight across treatments.**

## Conclusions

Of all five locations, none went over threshold for foliar diseases and a fungicide application was not made based on IPM recommendations. There was no evidence in these tests that an early-March application of a strobilurin fungicide improved yield or test weight. At four locations, the early-March insecticide application was not required. At the fifth location, the early-March insecticide failed to give adequate CLB control.

At 2009 pesticide prices, assuming pesticides were sprayed with a 90 ft ground applicator with 15 inch tires, and averaged across all tests, using IPM would have resulted in \$11-per-acre more profit than leaving the wheat unsprayed. **On the other hand, an early-March application (of either a fungicide, or insecticide, or both depending on the test) resulted in an average \$15 loss per acre compared to leaving all wheat unsprayed.**

*Note: Some have suggested that small plot comparisons of insecticide approaches may not represent results on a large farm scale. We plan to expand this research to include large scale tests in 2010.*