

OPTIMIZE Cotton N Fertilizer

Apply Half N Needed At Planting, Then More According To Sensor At Early Bloom, Specialist Says

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Optimizing nitrogen fertilization of cotton was a subject discussed by Dr. Don Boquet, Research Agronomist and cotton specialist with LSU AgCenter recently.

"We've showed an experiment here, where we had N rates from 0 up to 150 pounds and also split applications; then we had applications that were what we call sensor-based using the Greenseeker technology or Spad meter to look at the crop, the greenness and the total canopy and from that we determine whether the crop needs more nitrogen or not," he said. "I showed charts here that show that every nitrogen study we've done in a different situation shows a different result."

He has found that the optimum rate is usually about the same but the yield curves are somewhat different. Therefore the sensor based system is needed to best optimize the recommendations to farmers. The plan is to apply about half of the nitrogen one expects to need around planting time.

"One of the problems we have in cotton, of course, is that it's a crop that likes to grow vegetatively and, if we put all of our nitrogen out at planting time the system works fairly well; but some years there may be more growth than we want out of that," Boquet said. "So by putting out less nitrogen and then trying to predict how much we need at early bloom, using a sensor-based system, the Greenseeker, then we can apply just the nitrogen, we need and if we don't need it we don't apply it. So we've saved money by not applying too much and we've also done away with the possibility of having too much nitrogen early in the season."

The Greenseeker system is available to all farmers. While researchers use a device that's hand carried through the field, it could be mounted on a tractor as well. The system itself is rather easy to use, although it's also expensive to buy.

"We're looking at two systems, the Greenseeker which may cost about \$3,000; and the Spad meter about \$500," Boquet said. "The Spad meter only tells you the greenness of the crop, it doesn't tell you what the total canopy is like; the Greenseeker does. The Greenseeker may be the best way to go; it's off-the-shelf type technology so anybody can buy it. The key is knowing how to use it, however we've collected a lot of data for nitrogen applications. We were unfortunate last year in that we had several tests and then we had hurricane Gustav, so we lost a lot of the yield. So although we still had good results, yield was reduced quite a bit from what it should have been."

In a regional Cotton Incorporated sponsored research project, researchers are looking at several different times to do the sensing, centering mainly on very early bloom.

"We had a good canopy established so the sensor works well in that," he said. "It was not too late to apply nitrogen because, in that field, for example, from the applied N rates you can see growth difference. Where we put 0 nitrogen at planting, we still had a good crop started; and where we applied an additional 45 pounds at early bloom, that cotton looks as good as cotton that has 125 pounds. So we can apply at lower rates and then at early bloom apply with any additional we might need."

Of course, soil applications are recommended rather than foliar because you can't apply enough foliar generally if putting out the additional 40-45 pounds of nitrogen.

"We're looking at the ground applications, which can work at early bloom because the cotton is not yet too tall to get through it with equipment," Boquet said. "You can go in and apply UAN 32 or you could broadcast ammo-

num nitrate, even possibly urea, if you have sprinkler irrigation to make sure it was activated. If you're not irrigating, you can apply ammonium nitrate say June 20, and if it doesn't rain for 10, 20 days then you're behind in your application timing. So we don't recommend necessarily broadcast surface application."

Boquet discussed the different soil conditions, saying the silty clay loam is a good soil, but not well drained and it is more difficult to get a crop established in springtime.

"Once planted, the crop does quite well in it as long as it has enough moisture," he added. "The



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crop needs to develop the root system when there's enough moisture. Like this year, this was a typical year, wet early and then very dry, we didn't get much cotton development until it rained again because this root system won't be as extensive as it would be on a silt loam soil. So it has some limited root development, more than you get with a real clay, like a Sharky clay or Tunica clay or some of the other clays, but it still has limited root system compared with the silt loam soils."

In fact, Boquet said farmers may be moving back to the better soils for cotton.

"You know, Louisiana had a million acres; not many years ago we planted cotton in all soil types and there were some real challenges with tillage and other problems unique to some of our low elevation soils," he said. "This particular soil will develop a hard pan and it needs to be deep tilled every once in awhile to make sure you have good root development."

Subsoiling could be done every other year and even every year, according to research. However, it's a rather expensive to do when you consider equipment and diesel. In some years it might pay to do it every year.

"In this kind of dry year it might well be beneficial," Boquet said. "The crop would have a deeper root system. As a matter of fact we did not subsoil it last year and as I'm looking at it now, subsoiling may have been needed." Δ

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