bug infestations develop pre-flower in low vigor areas, those plants may not compensate for injury as well as high vigor classed plants. Action thresholds in Arkansas for tarnished plant bug are based on pest insect numbers as well as fruit retention. Thresholds in place in 2006 were sufficiently conservative for the lower pest tolerance of low vigor plants. Dynamic thresholds across variable fields could be considered pre-flower with a higher threshold applied in field areas with more tolerant plants.

Differences in crop susceptibility among vigor classes also has been measured late-season in studies at Wildy Farms. Significant differences in days to physiological cutout (nodes above white flower = 5) were observed in field areas (management zones) with low vigor classed plants compared to plants from medium and high vigor classifications. High yielding, high vigor classed plants remained vulnerable to insect feeding 5 to 18 days longer in the season. New infestations of plant bugs occurring after a crop, or management zone, has reached NAWF=5 +350 DD60s are unlikely to result in crop damage. Scouting, as well as spraying, for plant bugs could be suspended in those management zones under such conditions.

Managers considering site specific approaches for insect control should take into account variability in plant compensation capacity and tolerance for pest injury. Good crop production practices including judicious use of fertilizers and plant growth regulators along with appropriate irrigation management can increase crop tolerance to pest injury and allow growers to achieve high yields and early harvest.

Site-Specific Nematode Management In Cotton Production

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Many cotton producers in the MidSouth have experienced increased losses due to plant parasitic nematodes in recent years. While convenient, current producer standards of in-furrow treatments or seed treatments may not provide adequate levels of control in those portions of production fields where soil conditions and damaging nematode population levels combine with environmental conditions to maximize nematode damage.

Current management strategies used to reduce losses due to nematode infestations include crop rotation and/or nematicide application. Applications of nematicides are generally made uniformly across problem fields, although nematode damage is usually not uniformly distributed throughout problem fields; therefore the field-wide uniform application of nematicides can result in application to areas where either no nematodes are present, or populations are below economic threshold levels. The result is potentially adverse both economically and environmentally. In recent years, advances in site-specific management technologies have made it possible to apply soil fumigants for nematode control to only those areas susceptible to the highest levels of damage, without having to treat entire fields. The success of this concept will depend upon the ability to create prescription maps that are both accurate and affordable. Costs for labor, time, and laboratory assays related to intensive spatial or grid sampling to determine nematode population densities would typically be prohibitive. Alternative methods to accurately determine those areas of production fields in which plant parasitic nematodes have the potential to adversely affect crop yields are needed.

Soil type and texture have been shown to have a significant effect upon nematode population densities as well as distribution of nematode species. If the spatial distribution of soil texture within production fields could be economically and accurately mapped with sufficient detail, these maps might serve as the basis for site-specific nematode management. Recent research in Arkansas (Monfort et al) and Louisiana has shown that nematode populations alone are not a reliable indicator of potential response to nematicide application, and that nematode population thresholds change in relation to soil texture. Previous work in Louisiana has shown that adverse effects of root-knot nematode on cotton yield were more related to soil textural differences through the soil profile than to fall nematode population. The potential for the use of apparent bulk soil electrical conductivity (EC_a) measurements in developing management zones for root-knot nematode in Mississippi River alluvial soils has also been discussed (Overstreet et al., 2004).

In 2006, field research in cotton response to nematicides was conducted by the LSU AgCenter in 4 fields in Morehouse parish and 2 fields in Tensas parish, Louisiana. Telone II was applied in replicated strips across a wide range of soil textures using a no-till applicator. Early season cotton growth response to the nematicide application was analyzed using Normalized Difference Vegetative Index (NDVI) measurements derived from aerial imagery. Cotton yield response was analyzed using geo-referenced yield monitor data.

Analysis of yield monitor data showed that in Morehouse parish, the application of Telone II increased cotton yield by an average of 222 pounds of lint per acre over the untreated check in the responsive areas of the fields. In the non-responsive areas, the average yield increase was 60 lbs. In Tensas parish, the application of Telone II increased cotton yield by an average of 289 pounds of lint per acre over the Avicta treatment in the responsive areas of the fields, while the yield increase in the non-responsive areas of the field averaged 22 pounds of lint per acre.

This talk will cover the potential of using technologies such as soil electrical conductivity mapping, aerial imagery, and yield mapping as tools in the development of prescription maps for site-specific nematode management.

REFERENCES

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