# GIBBERELLIC ACID USE IN STALE SEED BED RICE PRODUCTION

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*REFERENCE*: J.E. Hook (ed.) *Proceedings of the 22nd Annual Southern Conservation Tillage Conference for Sustainable Agriculture*. Tifton, GA. 6-8 July 1999. Georgia Agriculture Experiment Station Special Publication 95. Athens, GA.

## INTERPRETIVE SUMMARY

Uniform emergence and adequate stand establishment are necessary for optimum yields in drill-seeded rice cultural systems. In recent years, most rice varieties that have been developed for commercial production are semidwarf plant types. These short stature rice varieties are often slow to emerge through the soil because of the reduced length of the coleoptile and mesocotyl. Gibberellic acid (GA) is a plant growth regulator that is very effective in improving rice emergence and stand establishment when used as a seed treatment. The first commercial uses of GA were oriented toward conventional tillage rice systems, which remains the predominant tillage system in U.S. rice production. There has been considerable interest in conservation tillage rice systems in recent years due to environmental concerns related to soil and nutrient loss associated with conventional tillage. Conservation tillage systems also show potential for decreasing production costs. In Louisiana, approximately 17% of the total rice acreage is devoted to some form of conservation tillage practice. The objective of this study was to determine if a GA seed treatment could provide the benefits realized in conventional tillage systems to a stale seedbed system.

An experiment was conducted in 1997-1998 to evaluate the response of GA-treated seed in a stale seedbed rice system and to determine the effect of variable seeding rate on rice production. In 1997, rice emergence and stand density were both increased with GA seed treatment, and this response was typical of the response found in conventional tillage systems. There are usually no direct benefits from GA associated with grain production unless stand densities are below minimum levels (<10 plants/$ft^2$), and in this experiment, grain yields were significantly lower with a seeding rate of 50 lb/A and no seed treatment. Final stand density at this seeding rate was less than 20% of the minimum required for optimum yield. When GA seed treatment was used, grain yield increased to levels measured at higher seeding rates. In 1998, stand densities averaged over tillage method and seeding rates were again increased with GA seed treatment, but grain yield was not affected. Seeding rates independently affected grain yield, and yield was significantly lower when stand densities were less than the minimum required.

This experiment demonstrated that GA seed treatment could improve emergence and stand establishment in stale seedbed rice systems. It is also important to recognize the contribution stand density makes toward grain production. Reduced seeding rates are of interest as a means of decreasing production costs, and while GA seed treatment can improve stand establishment at lower seeding rates, it is essential to maintain minimum plant populations (10 plants/$ft^2$) to insure grain yields are not reduced.

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