16th Annual National Conservation Systems Cotton & Rice Conference

SOYBEAN PRESENTATIONS

Program 4SB-2

Foliar Fungicide Applications In Soybean: How Important Is Timing?

Presented by Dr. Tom Allen
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Fungicides have become one of the more important management tools in Mid-southern soybean production systems. Over the past 10 years, research conducted at Mississippi State University (and other universities) suggests that making a single application of a strobilurin fungicide (QoI fungicide) at the R3/R4 growth stage (pod initiation) timing provides a yield benefit on the order of 3-6 bu/A more than 50% of the time. However, specific suggestions in the Mid-south generally target fungicide applications in high-yielding, continuous soybean, irrigated situations rather than applying fungicides to all soybean fields. In general, the targeted diseases are of greatest concern in situations where inoculum has been allowed to increase and overwinter in fields that are cropped to continuous soybean.

Foliar fungal diseases are generally of greatest concern once soybean plants reach reproductive maturity (R1, flowering). The impact from specific foliar diseases likely results in annual yield losses attributed to such diseases as Cercospora blight (late-season Cercospora), frogeye leaf spot, and the rare occurrence of soybean rust depending on the geographic location of the field. Annually, disease loss estimates are published by the Southern Soybean Disease Workers. In 2011, the disease loss estimates suggested that foliar diseases (aerial web blight, anthracnose, frogeye leaf spot, pod and stem blight, soybean rust) resulted in approximately 1.4% yield loss from 16 southern states. An annual loss of 1.4% resulted in a reduction of approximately 88 million bushels. Preventing yield loss can be achieved by fungicide application; however, application timing strategies as well as choosing the proper product and rate are important factors.

Application timing is one of the more important issues regarding fungicide application strategies. If fungicides are applied too early in the development of disease then a second application could be necessary. Such is the case when soybean rust threatens in years when the disease is observed early in the season. Or, apply the fungicide after disease has initiated and the product may not provide the necessary affect and yield loss will still result. Over the past several years the theory behind application timing strategies has greatly changed. Early, vegetative stage fungicide applications tank-mixed with herbicides (≈ V5/V6), early reproductive applications (≈ R1), or the more traditional application timings (R3/R4 or R5), or a late fungicide application to protect seed quality (≥ R6) can all provide benefits by protecting yield. However, little if any information exists regarding ultra-early, vegetative stage soybean fungicide applications and how those may prevent or reduce the likelihood of certain foliar diseases (e.g. Cercospora blight). In addition, reliable data regarding the protection of seed quality with late fungicide timings suggests the reaction can be quite variable.

In addition to the proper placement and timing of fungicides, coupling the product with cultural practices will likely enhance the longevity of specific active ingredients. The strobilurin class of fungicides provides broad spectrum activity against a wide range of important fungi. However, with the recent identification of strobilurin-resistant Cercospora sojina (the causal organism of frogeye leaf spot) the use of strobilurins to prevent yield loss when disease symptoms are observed should not be attempted. Fungi can produce many billions of spores in a heavily infected soybean field of a susceptible variety so the likelihood of resistance developing within a fungal population subsequent to fungicide application is quite high. More research regarding fungicide timing and specific product placement in situations where strobilurin-resistant fungi have been detected is necessary.

Program 11SB-2

Optimizing Row Spacing And Plant Population In Soybean

Presented by Dr. Jim Board
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Introduction

Selection of row spacing and target plant population for optimal economic benefit are two of the most important decisions a soybean farmer makes. Research data has not provided a consistent picture of whether or not narrow- compared with wide-row spacing results in yield increase. For example, in a study conducted by Bowers et al. (2000) (Agronomy Journal 92:524-531), soybean planted in the early soybean production system (ESPS) showed positive yield responses to narrow-row spacing at only 5 out of 10 locations across Texas, Arkansas, and Louisiana. Research also has not shown consistent responses to plant population. What farmers need to know is the minimal target plant population they need for optimizing yield (minimal optimal plant population). Unfortunately, previous research has shown this figure can vary from as little as 12,145 plant/A to as many as 202,430 plant/A. The objectives for this presentation are:

1). Identify conditions under which growers can expect yield increases in narrow vs. wide rows.

2). Determine how much of a yield increase can be expected from narrow-row spacing.

3.) Determine if recommended target plant populations can be reduced without affecting yield.

ROW SPACING BACKGROUND INFORMATION

When soybean was first introduced to the US about 125 years ago, it was grown on a wide-row spacing of 40”. This was required at that time because row spacing had to be at least 40” wide to allow passage of mules used for farm work. Currently, soybeans are grown on a wide range of row spacings, varying from the traditional 40” rows to spacings as narrow as 7”. Generally, wide-row spacing is defined as 30” or wider, whereas narrow-row spacing is anything less than 30”. Acceptance of narrow-row spacing is widespread across the Midwest and Southeast US growing regions. Acceptance has resulted from the following advantages shown for narrow-row culture: 1) potential yield increases; 2) weed suppression; and 3) greater ground cover to limit erosion. However, there are also disadvantages: 1) equipment incompatibility; 2) inability to cultivate for herbicide-resistant weeds; 3) greater difficulty in walking through the field to sweep for insects or check trouble spots; 4) yield responses are sometimes small or nonexistent.

PLANT POPULATION BACKGROUND INFORMATION

Because of the high seed costs for GMO soybean, growers are increasingly concerned about minimizing their seed costs without affecting yield. In essence, farmers want a target plant population that will give optimal yield with the fewest possible plants (minimal optimal plant population). Soybean yield responds to plant population in a plateau manner as described in Figure 1 below. At very low plant populations (10,000 to 30,000 plant/A), yield increases