

Considering the R3/R4 Automatic Application in Soybean: Time to Apply Two Modes of Action Instead of One

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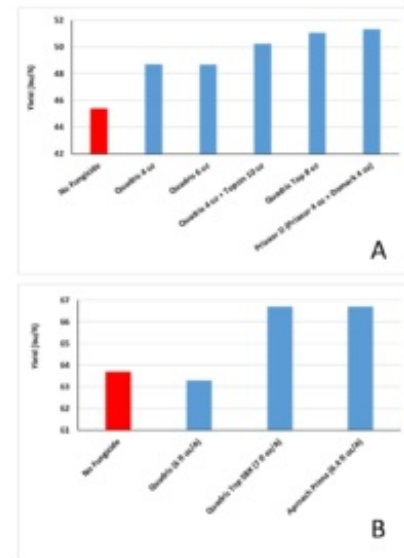
For the better part of a decade, soybean farmers have come to rely on fungicide applications as a necessary management practice. Research conducted during the early 2000s by MSU suggested that an automatic application of a stand-alone strobilurin (or quinone outside inhibitor (QoI) fungicide) could be economically beneficial in specific soybean situations. Those specific situations tended to be “high yield” environments. To more specifically define a high yield



environment, these included scenarios where: soybean had been planted continuously, soybean tended to be planted earlier as outlined in the early soybean production system (ESPS) and field situations were irrigated. Data from more than 10 years of trials suggested that in approximately 50-60% of the situations a modest, 3-5 bu/A, return could be expected. Notably, the fungicide applications were made based on growth stage timing generally in the absence of disease and independent of the long-range forecast. Applications made at either R3 or R4 were determined to provide the greatest return-on-investment. Over time the fungicide application shifted from a full rate of a comparable QoI (based on azoxystrobin (Quadris) this was 6 fl oz/A) to a reduced rate (4 fl oz/A) because agronomic data suggested no difference in yield. Over time some minor changes were made to the fungicide application suggestion. Fast forward to 2015 and the suggestion was altered to include frogeye leaf spot-susceptible soybean varieties. Suggested applications for FLS-susceptible varieties included a dual mode of action to account for QoI-resistant populations of the fungus. The suggested application products for FLS-resistant soybean varieties continued to be a stand-alone QoI product at the full rate (e.g., 6 fl oz/A of Quadris).

However, following several trials conducted during the 2015 and the 2016 season, data collected from multiple locations suggested that even in situations when a disease-resistant soybean variety was planted a dual mode of action (QoI + triazole (DMI) or QoI + carboximide (as with Priaxor)) as either a pre-mix product or a tank mix application provided a greater return. Comparisons during both years were made between a non-treated and strips that received a stand-alone QoI product. Trial data as outlined below were averaged across the locations conducted each year. Applications were made into field situations and locations were not rated for the presence of disease.

During 2015, three locations (Prentiss, Tunica and Washington County) were selected with FLS-resistant varieties to receive automatic fungicide applications at the R3 growth stage. Four different products were chosen representing a stand-alone QoI (Quadris at both 4 and 6 fl oz/A) a tank mix option (Quadris at 4 fl oz/A + Topsin at 10 fl oz/A) a pre-mix option (Quadris Top at 8 fl oz/A) and a co-pack option (Priaxor at 4 fl oz/A + Domark at 4 fl oz/A). A non-treated was also included as a comparison. Fungicide applications were made by ground, plots were randomized, applications were made in 15 gallons/A and strips were harvested with moisture adjusted to 13% (see Figure panel A TOP).



During 2016, three locations (Canton, Hollandale, Leland) were sprayed with each of three fungicides (6 fl oz/A of Quadris; 6.4 fl oz/A of Approach Prima; 7 fl oz/A of Quadris Top SBX) in addition to an untreated check for comparison purposes. Fungicides were applied by air in 5 gallons/A at both the Hollandale and Leland locations and by ground in 15 gallons/A at the Canton location and strips within each treatment were harvested with moisture adjusted to 13%. All three environments were high yield scenarios and on average the pre-mix fungicide products provided a +3 bu/A response. The stand-alone QoI provided a response of -0.4 bu/A (see Figure panel B BOTTOM).

As a result of the trials conducted we are suggesting that individuals wanting to continue to receive the same benefit from the R3/R4 automatic fungicide application apply either a pre-mix or tank mix that contains at least two modes of action. The above suggestion is made regardless of the disease susceptibility of the particular variety. In addition, a graduate student has initiated a larger research project to reevaluate the R3/R4 application procedure in small plot trials.