

Applied Research Report

2020 Eastland County Cotton Root Rot Fungicide Trial

Cooperator

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Summary

In response increased use of Topguard Terra fungicide to control cotton root rot (CRR), caused by the fungus, *Phymatotrichopsis omnivora*, and lack of experience with its options for application, we established a fungicide trial in a commercial field to compare a post-plant application of the fungicide with the grower's application at planting. The post-plant application was made June 4, 2020 as a 4-inch band on the planted row, a few days after planting, but before emergence, and included 4 fl.oz. and 8 fl.oz. rates. This area used in the test was not treated by the grower, but the surrounding field was. When assessed September 24, the non-treated rows had 92% incidence of CRR, while the 4 fl.oz. rate had a 35% incidence and the 8 fl.oz. rate had a 18% incidence. In comparison, the incidence of CRR in the surrounding area of the field treated at planting ranged from 8%-11%. A post-plant application of Topguard Terra eliminates the risk of phytotoxicity that can occur with an application at planting. The effectiveness of the post-plant application in this trial may have been positively affected by the presence of overhead irrigation to control watering, as well as a sandy soil that would permit some incorporation of the chemical by water. Before adopting this method, growers should include test strips in their fields to see how the method works for their operation.

Objective

The objective of this study was to evaluate the effectiveness of a post-plant, banded soil application of Topguard Terra for control of CRR, in comparison with the grower's at-planting method.

Materials and Methods

The trial was done in a commercial field in Eastland County (32° 5.176' -98° 55.909') that is under center pivot irrigation. The soil is a Chaney loamy sand (79% sand, 14% silt, 7% clay), pH 7.2 with 0.44% soil organic matter. The variety was DP 1948B3XF, planted on 36-inch row spacing with a plant population of 38,000 to 40,000 per acre. The trial was established June 4, 2020, about three days after planting, in a 12 row by 100-foot long area which was planted by the grower, but not treated with Topguard Terra. The cotton had started to germinate, but had not yet emerged.

The fungicide, Topguard Terra (flutriafol), was applied by hand in a 4-inch-wide band over the planted row with a backpack sprayer using CO₂ at 28 psi as the propellant and a single wand with a flat fan, XR8002VS nozzle. The rates were 4 fl.oz. and 8 fl.oz. per acre, applied in 5 gpa.

For each rate of fungicide, two adjacent, 100-foot rows were sprayed. There were two replicates for each treatment. The trial arrangement is shown in Table 1.

Results and Discussion

The plots were examined June 25 and there was no apparent difference in stand appearance among the treatments. On August 10, the plants were flowering, but there was no CRR anywhere in the field. The disease became apparent in early September and disease incidence counts were made Sept. 24. The disease incidence for each two-row replicate is shown in Table 1, along with the two rows on each side of the trial that was treated by the grower at planting.

Table 1. Incidence of CRR (%) in Each Two-Row Replicate and Arrangement of Topguard Terra Trial Replicates in the Field Trial Eastland County.

Grower application at planting	Not treated	4 fl.oz./A	8 fl.oz./A	Not treated	8 fl.oz./A	4 fl.oz./A	Grower application at planting
8%-11%	86%	27%	14%	97%	42%	22%	8%-11%

While both rates of post-plant applications reduced the CRR incidence as compared with the control, which was 92% (± 8 standard deviation), the incidence of CRR with the 8 fl.oz. rate was 18% (± 6), which was comparable to the incidence of CRR in the grower-treated area (8%-11%). The CRR incidence at the 4 fl.oz. rate was 35% (± 11). The appearance of the trial is shown in Figure 1.

Figure 1. CRR fungicide trial on September 24, 2020, showing plants killed by CRR.



This trial demonstrated that a post-plant application could be an alternative method of application for this grower. Although there were only two replicates for each treatment, the differences in disease incidence between non-treated rows and fungicide-treated rows was quite substantial. These results suggest that the area where the trial was conducted had a high, somewhat uniform distribution of the fungus. This is not always the case in trials. Often, the fungus is not

uniformly distributed in trials, leading to high variability among replicates. This variability makes it difficult to interpret whether a treatment or a rate is effective. This could be overcome by using more replicates, or by placing running checks (i.e. non-treated rows) between plots, which would also identify infested areas of the field. Future trials should use more replicates (at least three, preferably four). Growers are encouraged to do their own strip trials to evaluate changes in rates or application methods, but they should consider the possibility of disease variability within the field in interpreting results.

A post-plant application of Topguard Terra eliminates the risk of phytotoxicity that can occur with an application at planting. However, some of our data indicates that this method is not as effective as applications made at planting. The effectiveness of the post-plant application in this trial may have been positively affected by the presence of overhead irrigation to control watering, as well as a sandy soil that would permit some incorporation of the chemical by water. It may not be as effective under dryland conditions, but disease development is also more limited under dry conditions. Effectiveness might be lower in soils with a higher clay content. Relative inefficiencies with post-plant application may be compensated by increasing rates from what is used at planting. Before adopting this method, growers should include test strips in their fields to see how the method works for their operation.

Conclusions

Post-plant applications may be as effective as applications made at planting. However, growers should do comparative testing in their fields before adopting this method.

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