

**ARISE® SEEDLING BOOSTER:
A COTTON SEED TREATMENT
TO ENHANCE SEEDLING VIGOR
AND EMERGENCE**

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Abstract

Arise Seedling Booster is a natural product consisting of essential metabolites such as vitamins, amino acids, and plant hormones that are necessary to supplement the deficiencies that may occur during seed development or to replace metabolites that have been depleted during seed storage. The purpose of Arise is to increase the probability of early and vigorous stand, and to likewise decrease the probability of having to replant, whether from seedling disease, cold temperatures, excess rain, or situations where there may be sand blasting from high winds and desiccation of the plants. The more vigorous the seedling, the less likely it is that one would have to replant.

Introduction

We all are aware that seed vigor varies from season to season, crop to crop, and from variety of seed. This variation occurs in part because of the inability of the plant to store sufficient amounts of critical metabolites in the seed during seed maturity. The result is seed that is weaker and lacking the desirable vigor that we'd like to see to provide early stand establishment. It appears that this will be true of much of the seed from the 1995 crop.

Grower trials have been conducted during the past two years with cotton seed treated with Arise Seedling Booster to evaluate the enhancement of seedling growth. The difference in vigor of seedlings that were grown in the greenhouse was very evident. One can see the better tap root penetration of the seedlings that have been treated with Arise and seedlings had larger cotyledons and developed more quickly.

The 1994 grower trials in the Texas High Plains showed differences that can be seen in the field, where the Arise treated seed and the controls were planted behind two inches of rain and did not receive any additional moisture until late summer. Side by side comparison of these plants in early July showed that the Arise treated cotton that was planted in mid-May had much better vigor because of the better root system, had more nodes and leaves, and had better drought tolerance and showed less moisture stress.

In 1995, extensive grower trials were held in the Texas High Plains to evaluate emergence enhancement with Arise. The seed was generally treated with fungicide such as Captan, Baytan or Vitavax and then treated with the Arise Seedling Booster. Table 1 shows the effects of the Arise treatment as measured by days to a full stand between the seed receiving the pesticide only compared to the pesticide plus Arise. There was a difference of 4 to 5 days in emergence compared to the seed treated with Baytan only and 2 1/2 to 4 days from seed treated with Vitavax only. Captan-Arise treated seed showed similar differences when compared to the Captan only.

Comparison was also made, as shown in Table 2, of seed that had been treated with Arise in 1994 and held over and then planted in 1995, and compared to fresh seed. The fresh seed emerged in eight days. The year-old seed treated with Vitavax and Arise emerged to a stand in 5 1/2 days, or 2 1/2 day faster emergence with the Arise Seed Treatment.

Table 3 shows the effect of Arise Seedling Booster on boll production and boll size on dry land cotton in the Texas High Plains. The number of plants that were required to yield 100 bolls was 50 in the untreated, compared to 36 plants with the Arise treated, a difference of 14 plants. We are looking at about 2.7 bolls per plant in the Arise treated compared to 2 bolls per plant in the untreated. In addition to having almost one more boll per plant, the average boll weight of the Arise treated was about 1/2 gram more than the untreated. In the final analysis, the calculated lint yield in the check was 218 lbs, compared to 326 pounds with the Arise Seed Treatment, an increase of 108 pounds.

Conclusion

In conclusion, we believe that we have a management tool for the grower to enhance the probability of achieving a good stand and to decrease the probability of having to replant cotton. In fact, in the 15 or so field trials that were held in 1995, only one Arise treated field had to be replanted, and that was a field with very severe seedling disease. Several of the check plots had to be replanted. For example, in the comparison of the Arise treated year-old seed held over compared to the fresh seed, the fresh seed had to be replanted because of a wind storm that decimated the untreated seedlings, while the Arise treated seedlings had sufficient vigor to survive the sandstorm and produced a harvestable crop. The replanted acreage was not harvested because it was late when it was replanted and the season was too short for a crop.

Arise Seedling Booster looks promising as a seed treatment to increase the probability of an early stand under adverse conditions, and decreases the probability of having to replant. Arise Seedling Booster may be considered "Stand Insurance" in promoting a stand that will be maintained and will produce through the growing season.

Arise Seedling Booster will be available during the 1996 growing season. Distribution of these products is by Miller Chemical & Fertilizer Corporation (1-800-253-2040).

Table 1. Grower trials to evaluate emergence enhancement with Arise Seedling Booster in Texas High Plains

| <u>Seed Treatment</u> | <u>Days to Full Stand</u> | |
|-----------------------|-----------------------------|-------------------|
| | <u>Check (No Arise)</u> | <u>With Arise</u> |
| Baytan (HS-26)* | 11 | 6 to 7 |
| Vitavax (HS-26)* | 9 | 7 |
| Baytan (HS-26)** | 8 | 4 |

*Early May planting
**Late May planting

Table 2. Field trials to evaluate emergence enhancement with year-old carry-over Arise treated seed

| <u>Seed Treatment</u> | <u>Days to Full Stand</u> |
|-----------------------|---------------------------|
| Fresh HS-200 | |
| Vitavax treated seed | 8 |
| Year Old HS-200 | |
| Vitavax and Arise | 5.5 |
| Arise Benefit | 2.5 |

Table 3. Effect of Arise Seedling Booster on boll production and boll size of dryland cotton (very dry). Variety HS-26. Lamesa, Texas. 1995.

| | <u>Check</u> | <u>Arise</u> | <u>Arise Difference</u> | <u>Sig. Level(%)</u> |
|-------------------------|--------------|--------------|-----------------------------|--------------------------|
| Plant number* | 50 | 36 | -14 | 0.02 |
| Boll weight grams) | 3.38 | 3.93 | 0.55 | 0.02 |
| Lbs. lint per acre** | 218 | 326 | 108 | 0.04 |

* Number of consecutive plants to yield 100 bolls.
** Calculated based on 33% gin out for hand picked cotton.