

**SUPER START, SUL-15, GS-48, AND GS-70.
PLANT GROWTH REGULATORS CARRIED
WITH FOLIAR FERTILIZERS
FOR COTTON PRODUCTION**

**Barry Aycock
Aycock Agricultural Services
Parma, MI**

Abstract

Green-Sol is a group of Environmental Protection Agency registered products specifically designed to maximize crop performance through the use of hormones that occur naturally in the plant. Use of Green-Sol products results in plants that are more resistant to stress, produce high quality, maximize yields, and are earlier maturing. Each Green-Sol product is different and contains major plant nutrients, essential micronutrients, and plant growth hormones that promote and regulate plant development. The Green-Sol line is water soluble or liquid in formulation. Each product in the Green-Sol System is designed to be used for a specific purpose and at specific times in the plant growth cycle.

Introduction

The system for earliness consists of four products; Super Start, Sul-15-Plus, GS48, and GS70. Each product is synergistic to the next, maintaining the essential cycle necessary in cotton growth. Since each product is utilized at different developmental stages of the growth cycle, their unique attributes aid a more bountiful progression to the next stage. Super-Start is a liquid 3-12-3 blend with micronutrients, gibberellic acid, and Cytokinin as Kinetin. The primary and secondary nutrient effect on the germinating seed results in rapid emergence and vigorous growth promoting a strong root system and subsequent growth. Super-Start is used as a seed treatment. Sul-15-Plus is a liquid formulation that contains gibberellic acid and a unique combination of sulfur and nitrogen that facilitates uptake of the hormone by the plant. Sul-15-Plus aids in root growth and stimulates early shoot development and the plant reproductive phase. Sul-15-Plus is applied at the Second-True-Leaf. GS48 contains gibberellic acid and cytokinin growth regulators in a water soluble 8-20-20 nutrient blend with micronutrients. GS48 is designed to improve plant vigor, crop quality, early maturing, and higher yields. GS48 is typically used early in the plant growth cycle, usually between the time the first true leaves are present and before bloom. GS70 is a water soluble 10-52-8 nutrient blend with micronutrients and cytokinin for stimulating plant growth. GS70 is usually applied before bloom because of its unique ability to encourage transition

of the plant from the vegetative stage to the reproductive stage. Applications are timed to correspond with Pix applications. Application commonly results in early maturity, a more compact fruiting factory, and increased yields. The uniqueness of Green-Sol's plant hormones is that the foliar fertilizer assures uptake into the leaves of the plant hormones.

Materials and Methods

1997

The cotton variety Stoneville 474 was used for this experiment. The test was a replicated comparison. Four replications was machine harvested and weighed separately. Data was collected in T1 and T2 at random sites throughout each treatment. This test was planted on May 7, 1997 and furrow irrigated three times. The fertilizer rate on T1 and T2 was 100N-50P-100K.

1998

The cotton variety Stoneville 474 was used for this experiment. The test was a replicated comparison. Although this test had 6 replications, only 4 were machine harvested and weighed separately. Specifically, each treatment has 6 replications. Each treatment had 100N-60P-50K-15S-1B.

1997-Two Treatments

Treatment 1:

- 4 oz. Super Start/Seed Treatment
- 16 oz. Sul15 Plus + 3oz. GS 48 2nd true leaf
- 6 oz. GS 70 + 8oz. Pix at Pinhead Square
- 8 oz. GS 70 + 8 oz. Pix +10 Days
- 8 oz. GS 70 + 8 oz. Pix + 10 Days
- 3 lbs. 13-0-46 at Full Bloom
- 3 lbs. 13-0-46 at Speckle Boll

Treatment 2:

Untreated (Check) –Farmer's Standard Practice

1998-Four Treatments

Treatment 1:

Untreated (Check)-Farmer's Standard Practice

Treatment 2:

4 oz. Super Start/50 lbs. Seed

Treatment 3:

6 oz. Super Start/50 lbs. Seed

Treatment 4:

- 4 oz. Super Start/50 lbs. Seed
- 3 oz. GS 48 at 2nd True Leaf
- 16 oz. Sul 15 at 2nd True Leaf
- 6 oz. GS 70 Pinhead Square & 8 oz. Pix
- 8 oz. GS 70 & 8 oz. Pix + 10 Days
- 8 oz. GS 70 & 8 oz. Pix + 10 Days
- 3 lbs. 13-0-46/acre at Full Bloom
- 3 lbs. 13-0-46/acre at Speckle Boll

Results and Discussion

1997 Results

Treatment 1:

843 lbs./acre

Treatment 2:

786 lbs./acre

Table 1. Influence of seed treatment Super Start with 2nd True-Leaf Application of GS 48 on Seedling Emergence and Growth of the Cotton variety Stoneville 474 in a replicated comparison.

Emergence %	Plant Height(cm)				Root Length(cm)	
	Day 3	Day 5	Day 7	Day 15	Lateral Root	Total Root
T1	80a	95a	6.9a	13.0a	24.8a	38.6a
T2	65b	80b	5.4b	12.7b	22.3b	26.3b

Mean separation within columns by LSD. Means with the same letters are not significantly different at P=0.05.

Table 2. Influence of Seed Treatment Super Start with 2nd True-Leaf Application of Gs 48 on Seedling Leaf Area, Leaf and Stem Dry Weight of the Cotton variety Stoneville 474 in a replicated comparison 14 days after emergence.

Treatment	Leaf Area (cm)2		Dry Weight (G)		
	Cotyledon	Total Leaf	Cotyledon	Total Leaf	Stem
T1	28.4a	79.5a	.14a	.36a	15a
T2	26.7a	75.3a	.12a	.35a	.12a

Mean separation within columns by LSD. Means with the same letters are not significantly different at P=0.05.

Table 3. Influence of the Seed Treatment Super-Start and 2nd True-Leaf Application of GS 48 on seedling dry weight of the cotton variety Stoneville 474 in a replicated comparison 14 days after emergence.

Treatment	Dry Weight (g)			
	Shoot	Root	Total	Root/Shoot Ratio
T1	.64a	.18a	.79a	.26a
T2	.62a	.14a	.74b	.21b

Mean separation within columns by LSD. Means with the same letters are not significantly different at P=0.05.

1997 Summary

The response of cotton seedlings to seed treated with Super-Start at the 4oz/acre rate and 1 pt. Sul-15 Plus with 3 oz. GS 48/acre was evaluated by replicated comparison.

Seedling emergence for T1 was significantly higher than T2 by day 2 after emergence. Seven days after emergence T1 had a higher average seedling emergence over T2. T1 at the 4 oz. rate significantly increased plant height compared to the control (T2) 10 days after emergence. Total root length for T1 at the 4 oz/acre rate was significantly greater than the check (T2).

The response of GS 70 with Pix created a more compact fruiting factory over the check (T2). Fruit retention was 87% in T1 and 79% in T2. Pix was used at the 32 oz./acre rate for T1 and T2. Internode length or height to node ratio remained under 2 all season long for T1. T2 averaged 2.3 throughout the season at different intervals. The Pix was better utilized with the aid of GS 70. Average days for first flower for T2 was 59 days. Average days to first flower for T2 was 61 days.

1998 Results

Treatment 1:

736 lbs./acre

Treatment 2:

763 lbs./acre

Treatment 3:

784 lbs./acre

Treatment 4:

827 lbs./acre

Table 1. Influence of seed treatment Super Start with 2nd True-Leaf Application of GS 48 on Seedling Emergence and Growth of the Cotton variety 474 in a replicated comparison.

Emergence %	Plant Height (cm)				Root Length (cm)	
	Day 3	Day 5	Day 7	Day 15	Lateral Root	Total Root
T1	70b	76b	5.2b	12.8b	22.6b	32.6b
T2	84a	90a	6.2a	13.8b	25.3a	41.3a
T3	82a	90a	6.3a	13.8a	25.0a	40.2a
T4	80a	88a	6.5a	14.0a	24.8a	41.3a

Mean separation within columns by LSD. Means with the same letters are not significantly different at P=0.05.

Table 2. Influence of Seed Treatment Super-Start with 2nd True-Leaf Application of GS 48 on Seedling Leaf Area, Leaf and Stem Dry Weight of the Cotton variety Stoneville 474 in a replicated comparison 14 days after emergence.

Treatment	Leaf Area (cm)2		Dry Weight (g)		
	Cotyledon	Total Leaf	Cotyledon	Total Leaf	Stem
T1	28.4a	79.5a	.13a	.38a	.13a
T2	29.5a	81.3a	.14a	.36a	.15a
T3	29.2a	80.2a	.12a	.38a	.14a
T4	28.3a	80.7a	.14a	.37a	.14a

Mean separation within columns by LSD. Means with the same letters are not significantly different at P=0.05.

Table 3. Influence of the Seed Treatment Super-Start and 2nd True- Leaf Application of GS 48 on seedling dry weight of the cotton variety Stoneville 474 in a Replicated Comparison, 14 days after emergence

Treatment	Dry Weight (g)			Root/Shoot Ratio
	Shoot	Root	Total	
T1	.65a	.16a	.71b	.24b
T2	.65a	.20a	.76a	.29a
T3	.64a	.18a	.76a	.28a
T4	.66a	.18a	.78a	.29a

Mean separation within columns by LSD. Means with the same letters are not significantly different at P=0.05.

1998 Summary

The response of cotton seedlings to seed treated at the 4 oz./acre rate and 6 oz./acre rate was evaluated in a replicated comparison. Seedling emergence for T2, T3, and T4 was significantly higher than T1-2 days after emergence. Seven days after emergence, T2, T3, and T4 had a higher average seedling over T1. T2, T3, and T4 significantly increased in plant height compared to the control (T1) 10 days after emergence. Total root length for T2, T3, and T4 was significantly greater than T1.

The response of GS 70 with Pix created a more compact, less vegetative plant. Fruit Retention for T1 was 73%, T2 was 76%, T3 was 86%, T4 was 84%. Height to node ratio recorded at different intervals for T1 averaged 2.5, T2 was 1.8, T3 was 2.0, T4 was 2.2. The Pix was taken into the plant and used more efficiently by T2, T3, and T4. Average days to first flower for T1 was 62, T2 was 61, T3 was 60, and T4 was 60.