# Comparison of Three Plant Growth Regulator Products on April Planted DPL 555BR Cotton, 2005

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***Abstract***

*Three plant growth enhancement treatments were applied to April-planted DPL 555BR cotton on the morning of July 2, 2005. Plant parameter data were obtained during July, and yield and quality data were obtained at harvest in December. Usage of Chaperone™ resulted in decreased potassium and phosphorus levels in petioles, as well as increased amounts of leaf chlorophyll. Treatments initially resulted in less fruiting structure/plant but had more than the untreated cotton at 26 days post treatment, with highest numbers per plant noted from the HappyGro™ + PhotoGro treatment. Each treatment resulted in less seed cotton and lint per acre than the untreated cotton. Less spotting associated with treated cotton increased the lint strength and increased trash levels. The AuxiGro® WP + CalMax® + Foliar Pride treatment resulted in the highest fiber strength per pound and lint value.*

## Introduction

Cotton production in the low desert areas of Arizona and California is often negatively affected by the high summer temperatures which have deleterious effects on yield, with crop losses due to this factor estimated to be at least one bale/acre in many years.

A number of plant growth enhancers have recently become available for usage on cotton, with the expectations being that these products can potentially offset the effects of high temperature. These products include AuxiGro, Chaperone™, and HappyGro™. All three of these products are currently registered for usage on Arizona cotton, with Chaperone™ being registered in 2005.

Chaperone™ is labeled as a protein transport enhancer, and consists of a three active ingredients. These are sodium p-nitrophenolate (0.30%); sodium o-nitrophenolate (0.20%), and sodium 5-nitroguaiacolate (0.10%). The label notes that this product increases the uptake of proteins that are necessary for plant growth resulting in increased yield. A number of posters and presentations at recent Beltwide Cotton Conferences have indicated that usage of Chaperone™ in Texas and Arkansas resulted in yield increases. The exact reason for this is still unknown and may be partially a factor of increased insect control of lepidopterous insect larvae, as has been documented (under elevated temperatures) to increase protein concentration and therefore efficiency of endotoxin expression (Brown and Oosterhuis, 2004 or 05?).

Yield increases from usage of Chaperone™ in the low desert would be expected from better plant growth rather than from usage of this product due to insect control however. The most damaging lepidopterous pest (pink bollworm) is very adequately controlled by current cotton varieties containing *Bacillus thuringiensis* while other lepidopterous pests are prevalent in Texas and Arkansas area. Usage of Chaperone™ for insect control in the low desert via enhanced protein concentration may be most effective in late summer and early fall period as days shorten and daily photosynthetic rates decrease, the same period that pink bollworms are surviving longer into their development with this effect thought associated with less expression of *Bacillus thuringiensis* in cotton plants at this time of year.

HappyGro™ is labeled as a natural plant growth regulator that produces positive plant growth and development. The active ingredient is cytokinin (as kinetin) 0.5% w/w. HappyGro™ is formulated with proprietary inerts that affect treated plants to increase cell division, cell differentiation, and cell growth. Use of this product, according to its label, will result in quicker green up, higher photosynthesis, and improved plant quality. PhotoGro™ is a 2-0-0, 0.9% boron, and 0.9% zinc fertilizer. Both products are marketed by LT Biosyn, Ltd.

AuxiGro® is labeled as a plant metabolic primer. The active ingredients in AuxiGro® WP are equal amounts of gamma aminobutyric acid (also referred to as GABA) and L-glutamic acid (each 29.2%). GABA is known to occur in animals, and functions as a neurotransmitter. In comparison with animals, the role of GABA in plants is not as well documented or understood at this time. Kinnersley (1997) noted that "mineral analysis of treated plants has shown an increase in the content of macronutrients needed for plant growth with the most consistent increase shown in tissue potassium. In treated rye grass and duckweed, levels of potassium increased more than 200%. The correlation between GABA-mediated increases in plant growth and increases in tissue potassium content led to a working hypothesis that GABA bioactivity is plants is similar to its mechanism of action in animals, where it is known to affect transport of calcium and potassium". Tindall (2001) notes that plants release GABA through the mitochondria when undergoing a period of stress, with GABA then opening nutrient channels within cell walls, allowing a redistribution of nutrients to areas being affected by outside influences. The response of stressed cotton to AuxiGro® application may be negated by previous release of GABA associated with stress, and may not reflect those noted from recent low desert experiments.

Experimentation during each of the summers of 2002-2004 in the Palo Verde Valley documented the effects of AuxiGro® WP in various crop production situations, with a range of results. Application of AuxiGro® WP + CalMax® without additional foliar nutrition in 2004 to three different varieties resulted in three additional fruiting nodes when compared with the check, but also resulted in reduced retention and a range of positive to negative yield responses, indicating that varieties vary widely in their responses (Rethwisch et al., 2005). Usage of AuxiGro® WP with a foliar fertilizer in 2003 to stressed cotton resulted in a significant increase in retention rates with a single application, but not sequential applications (Rethwisch et al., 2004). Usage of this product applied with foliar fertilizers prior to stress conditions in 2002 resulting in the best combination treatment increasing cotton yield and lint value of $190/acre in the best situation (Rethwisch et al., 2003).

These products had been initially compared during the summer of 2004 on DPL 449BR cotton in the Palo Verde Valley of far eastern Riverside County, with most products resulting in decreased yields when compared with untreated cotton. Extremely low levels of nitrogen in plants at time of application may have caused plants to be less responsive than adequately fertilized plants and may have contributed to yield responses that are inconsistent with previous results (Rethwisch et al. unpublished). The 2005 trial was conducted to compare various plant growth enhancers on DPL 555BR cotton as no comparative data existed for these products on this cotton variety under low desert conditions as DPL 555BR has different growth habits than DPL 449BR.

## Methods and Materials

A field of DPL 555BR cotton planted approximately April 10, 2005, ??and then irrigated to initiate germination?? was selected for this experiment. Just prior to experiment initiation, a soil sample was taken (0-24") to obtain reference points (Table 1) for soil fertility levels and potential interactions with plant growth enhancement chemistries.

Three treatments, replicated four times in a randomized complete block design, were applied July 2 beginning at 6:30 a.m. with a John Deere 6000 High Cycle Sprayer at a rate of 8.9 gpa to plots that were 12 rows wide x 1,000 ft long. Treatments were Chaperone™ at 5 oz of product/acre, HappyGro™ + PhotoGro™ each at 1.06 oz/acre (12 oz./100 gal of solution), and AuxiGro® WP at 4 oz./acre + 1 qt/acre for each First Choice® Foliar Pride and CalMax® (10-0-0-11 Ca). Foliar Pride is a foliar fertilizer marketed by Western Farm Services containing 7% nitrogen, 14% phosphoric acid, 8% potash, 0.1% iron zinc and 0.05% zinc as well as 0.15% humic acids derived from leonardite. CalMax® is a foliar fertilizer marketed by Western Farm Services consisting of 10% nitrogen, 11% calcium, 1.2% magnesium, 0.1% iron, 0.1% manganese, 0.05% boron, 0.05% copper, 0.05% zinc, and 0.001% molybdenum.

Prior to adding treatments to the mix tank, water was buffered with 1 pt. of Tri-Fol® (25% aliphatic polycarboxylate, 3% calcium, Wilbur Ellis Co.)/100 gallons. After treatments were in solution, First Choice® Solar™ was added to the spray tank at the rate of 1 pt/100 gallons with the intent of keeping product moist for a longer period of time, thereby increasing uptake and effectiveness. First Choice® Solar™ is a spreader sticker methylated seed oil, comprised of a proprietary blend of 99% polyalkyleneoxide modified polydimethylsiloxane nonionic emulsifiers and methylated seed oil (marketed by Western Farm Service, Inc.). Immediately after experimental treatments applications were completed (9:45), the entire field was treated with 32 oz./acre of Farm$aver mepiquat chloride (4.2%) + 4 oz./acre of CoRoN (Helena Chemical).

Chlorophyll data were collected on July 14 and 26 with a Minolta 502 SPAD meter. Data were collected from the fifth terminal leaf of 15-25 plants in each plot.

Plant mapping was conducted on July 13 and July 28, and consisted of removing five plants per plot, and counting and recording numbers of nodes, plant height, first fruiting node, and presence/absence of fruiting structures at the first three positions for each fruiting branch. Percent retention and fruiting structures/plant were then calculated.

As plant growth regulators may affect nutrient uptake and levels, petioles of 25-30 cotton leaves (fifth leaf from terminal) per plot were gathered on July 17-18 to determine such. Petiole samples were analyzed for nitrogen, phosphorus and potassium levels (Stanworth Crop Consulting, Blythe, CA).

Plots were harvested on Dec. 12, 2005. All twelve rows of each individual plot were harvested, and seed cotton weights were obtained utilizing the yield monitor on the cotton picker. All 48 rows of the same treatment were placed together in a module and kept separate from cotton from other treatments to obtain quality and turnout data after ginning (Modern Gin, Blythe, CA). The turnout and other information were then utilized to calculated lint yields per acre as well as acreage values of cotton.

Data and treatment means were statistically analyzed using Fisher's least significant difference (Statgraphics for Windows, Manugistics, Inc.).

## Results

*Petiole analyses*

Treatments significantly affected petiole content of nitrogen, phosphorus and potassium (Table 2). All three treatments resulted in reduced petiole nitrate at 15-16 days post treatment, with HappyGro™ + PhotoGro (10,982 ppm) and the AuxiGro® WP + CalMax® + Foliar Pride treatments (10,982 ppm) resulting in significant reduction when compared with the check (14,080 ppm). Chaperone™ treated cotton was intermediate between these (12,127 ppm).

Highest phosphorus content was noted from the untreated check (1,547 ppm), followed by the AuxiGro® WP + CalMax® + Foliar Pride treatment (1,495 ppm). Application of both Chaperone™ (1,272 ppm) and HappyGro™ + PhotoGro™ (1,341 ppm) resulted in signficantly reduced petiole phosphorus when compared with the untreated check.

Although the untreated check had the highest levels of nitrate and phosphorus, this was not true for percent potassium as two of the treatments had numerically higher percentage than the check. Highest potassium percentage was very similar in the HappyGro™ + PhotoGro™ (5.78%) and the AuxiGro® WP + CalMax® + Foliar Pride (5.79%) treatments, followed by the untreated check (5.54%). Potassium percentage was significantly lower in Chaperone™ treated cotton than in any other treated or untreated cotton.

The reasons for these significant differences in petiole nutrients is unclear, but may be related to mode of action of products, although this would be expected to increase nutrient levels rather than result in lower levels for nitrogen and phosphorus.

*Chlorophyll content*
Cotton plants treated with the protein transport enhancer Chaperone™ resulted in significantly higher leaf chlorophyll levels than untreated cotton on both July 12 and 26 as measured by the Minolta 502 SPAD meter (Table 3). Chlorophyll levels were least in untreated cotton on both sample dates. Chlorophyll levels were intermediate for the other two treatments between these extremes on both sample dates, and were significantly different than both on the July 26 sample date.

It is interesting to note that leaf chlorophyll was higher in treated cotton than untreated cotton on both sample dates, yet petiole nitrogen was reduced due to treatments and highest in untreated cotton. This may be a function of other plant growth aspects.

*Heights, Nodes and Height:node ratios*
No statistical differences were noted on July 13 for plant height, mean number of nodes/plant, or height:node ratio (Table 4). Lowest height:node ratio (1.51) was noted in the untreated check, although untreated cotton also had numerically more fruiting nodes/plant than DPL 555BR cotton treated with plant growth enhancement chemistries. Plant height receiving the HappyGro™ + PhotoGro™ treatment was almost two inches taller than cotton treated with other chemistries or untreated cotton. Lack of statistical differences on this sample date may be partially due to the short time (11 days) from application to sample date, and plants growth may not have had enough time to fully express physiological differences in these measured plant parameters.

No statistical differences existed for plant height on July 28 (26 days after treatment) although the mean height of the AuxiGro® WP containing treatment was 1.5 inches shorter than the next tallest treatment (Chaperone™, 34.2 inches). Chaperone™ was similar to that of the untreated check (35.1) and the HappyGro™ + PhotoGro™ treatment (35.7).

No statistical differences existed on July 28 for nodes or height:node ratio either, although both the Chaperone™ as the HappyGro™ + PhotoGro™ treatments resulted in numerically more nodes (2.2+) than the untreated check (21.15). Number of nodes in cotton treated with the AuxiGro® WP + CalMax® + Foliar Pride treatment (21.6) was very similar to that of the untreated check. Height:node ratios ranged from 1.46 (Chaperone™) to 1.66 (untreated check).

*Fruiting nodes*
No statistical differences existed for first fruiting node on either July 13 or 28 (Tables 4-5). although Chaperone™ and HappyGro™ + PhotoGro™ treatments resulted in numerically higher first fruiting node, and all treatments resulted in fewer fruiting nodes/plant than the untreated check on July 13 (Table 4).

Cotton treated with Chaperone™ had the lowest first fruiting node (6.6) on July 28 (Table 5) but did not result in a statistical difference. Mean first fruiting nodes were very similar all other treated/non-treated cotton (7.45-7.85). Significant differences were noted for number of fruiting nodes, as Chaperone™ treated cotton (16.85) had significantly more fruiting nodes than the untreated check (13.3). Other treatments resulted in numbers of fruiting branches between these two means (Table 5).

*Retention percentages*
Retention percentages were similarly lower for treated cotton than untreated cotton on July 13 (Table 6) although these differences were not statistically different. The similarity in treated cotton results is intriguing in light of only 11 days passing since treatment application and application of mepiquat chloride. This suggests that inclusion of TriFol® may also affecting this cotton variety, although further testing is necessary to evaluate this treatment parameter.

Retention percentages decreased from July 13 to July 28. Chaperone™ treated cotton had lower retention percentages on July 28 compared to other treatments (Table 7). This may partially be explained by more fruiting nodes for this treatment. Retention percentages for all other treatments were very similar (42.2-43.4% for positions 1-2, 45.0-46.6% for positions 1-3).

*Calculated fruiting structures/plant*
No statistical differences existed for mean fruiting structures/plant on either July 13 or 28. (Tables 8-9). Numbers of

such structures decreased between the two sample dates, however such reduction was greatest in untreated cotton. It should be noted that untreated cotton had numerically more mean fruiting structures/plant on July 13 than from treated cotton (Table 8).

All three plant growth enhancement treatments resulted in increases of calculated fruiting structures of 2.7-21.4% per plant when compared with the untreated check on July 28 (Table 9). Highest numbers of such structures were noted from the HappyGro™ + PhotoGro™ combination (13.3/plant for positions 1-2, 22.1/plant for positions 1-3), an increase of 17.7 and 21.4% respectively for these sites. Chaperone™ and AuxiGro® treated cotton were similar to each other, with less than half the noted increase of HappyGro™ + PhotoGro™.

*Yields and turnout percentages*

No significant differences existed for pounds/acre of seed cotton (Table 10) although each of the three treatments resulted in about 250 pounds less seed cotton/acre than the untreated check. Turnout percentages ranged from slightly over 32% (32.15% for AuxiGro® + CalMax® + Foliar Pride; 32.14% for untreated cotton) to 29.45% for the HappyGro™ + PhotoGro™ treatment. Chaperone™ treated cotton resulted in an intermediate turnout percentage of 30.98%.

All treatment resulted in less lint per acre (approximately 100 lbs./acre) than untreated cotton (613 lbs./acre). Lint yields for treatments were very similar (Table 10), but paralleled the turnout percentages among treated cotton (AuxiGro® + CalMax® + Foliar Pride, 528 lbs; Chaperone™, 519 lbs.; HappyGro™ + PhotoGro™, 488 lbs./acre).

*Lint quality*

All three plant growth enhancer treatments resulted in a slight increase in leaf content (3.0) when compared with the untreated check (2.7). All three treatments also resulted in a slightly lower micronaire (4.6) than the untreated check (4.86) (Table 11). Staple length in treated cotton was also longer than that in untreated check (1.09 inches, staple 35), although cotton fiber length differed slightly by treatment. Longest fibers were noted in the AuxiGro®, CalMax® and Foliar Pride treatment (staple 36, length 1.11 inches) as well as the HappyGro™ + PhotoGro™ combination. Cotton treated with Chaperone™ was intermediate (1.10 inches, 35 staple) between that for the two treatments and the untreated check.

Best color grade for cotton was that of the HappyGro™ + PhotoGro™ combination, which was the only treatment to result in a lint grade of less than 31. Significant differences in spotting were noted, with least spotting noted in the AuxiGro® WP + CalMax® + Foliar Pride treatment (1.0) and most in the untreated check (1.6) (Table 11).

Fiber strength was also increased by all plant growth enhancer treatments, with strength increase of a minimum of 0.5 g/tex noted from Chaperone™ as well as the HappyGro™ + PhotoGro™ combination (31.1 g/tex) over the untreated check (30.6). Strongest fiber strength was noted from the AuxiGro® WP + CalMax® + Foliar Pride treatment (31.5 g/tex). The increase in fiber length and strength for the AuxiGro® WP treatment when compared with untreated cotton is consistent with previous results that noted from this treatment on other Delta and PineLand cotton varieties in the low desert (Rethwisch et al., 2005).

Uniformity differences due to treatments was also noted, with highest uniformity (80.5) noted from the Chaperone™ as well as the HappyGro™ + PhotoGro™ treatments. Cotton treated with the AuxiGro® WP + CalMax® + Foliar Pride treatment had the lowest uniformity (79.7), with that of the untreated check (80.11) being intermediate between the treatment extremes.

*Value of cotton fiber*

The AuxiGro® WP + CalMax® + Foliar Pride treatment resulted in the highest valued cotton on a per pound basis (Table 10), with a B value of 26.66, followed by the HappyGro™ + PhotoGro™ combination treatment (25.06). Both of these were significantly greater than that of the untreated check (21.57).

## Literature Cited

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**Table 1. Soil nutrient levels (ppm) on application date (July 2, 2005).**

| | | | |
|---|---|---|---|
| $NO_3$-Nitrogen | 16.0 (low) | $PO_4$ Phosphorus | 14.0 |
| Potassium | 114 (low) | Calcium | 6,121 (high) |
| Magnesium | 1,099 (high) | Sodium | 271 |
| Iron | 63.8 (high) | Manganese | 4.8 (high) |
| Zinc | 4.56 (high) | Copper | 16.03 (high) |
| ESP | 2.87% | ECe | 1.38 dS/cm |

**Table 2. Effects of various plant growth regulator treatments applied July 2, 2005, on DPL 555BR cotton petiole analyses on July 17-18, Blythe, CA - 2005.**

| | | ppm | | |
|---|---|---|---|---|
| Treatment | Rate/acre | NO3 N | PO 4 | %K |
| AuxiGro® WP | 4.0 oz | 10,998 b | 1,495ab | 5.79a |
| + CalMax® | 1 qt | | | |
| + Foliar Pride | 1 qt | | | |
| Chaperone™ | 5.0 oz | 12,127ab | 1,272 c | 4.89 b |
| HappyGro™ | 1.06 oz | 10,982 b | 1,341 bc | 5.78a |
| + PhotoGro | 1.06 oz | | | |
| Untreated Check | ----- | 14,080a | 1,547a | 5.54a |

*Means in columns followed by the same letter are not statistically different at the P<0.05 level (Fisher's LSD test).*

**Table 3. Leaf chlorphyll content of DPL 555BR cotton following various plant growth regulator application on July 2, 2005.**

| Treatment | Rate/Acre | July 14 | July 26 |
|---|---|---|---|
| Chaperone™ | 5 oz. | 48.4a | 47.6a |
| AuxiGro® WP<br>+ CalMax® | 4 oz.<br>1 qt | 46.2ab | 45.2 b |
| HappyGro™<br>+ PhotoGro | 1.06 oz.<br>1.06 oz. | 46.7ab | 45.3 b |
| Untreated check | ------ | 44.7 b | 43.3 c |

*Means in columns followed by the same letter are not statistically different at the P<0.05 level (Fisher's LSD test).*

**Table 4. DPL 555BR cotton plant mapping data on July 13 following plant growth regulator application on July 2, 2005, Blythe, CA.**

| | | | Nodes/ | Ht:Node | Fruiting nodes | |
|---|---|---|---|---|---|---|
| Treatment | Rate/acre | Height | plant | Ratio | First | per plant |
| AuxiGro® WP<br>+ CalMax®<br>+ Foliar Pride | 4.0 oz<br>1 qt<br>1 qt | 32.1a | 20.45a | 1.57a | 5.9a | 15.55a |
| Chaperone™ | 5.0 oz | 31.95a | 20.25a | 1.60a | 6.25a | 15.0a |
| HappyGro™<br>+ PhotoGro | 1.06 oz<br>1.06 oz | 34.8a | 21.75a | 1.64a | 7.3a | 15.45a |
| Untreated Check | ----- | 32.0a | 21.2a | 1.51a | 5.9a | 16.8a |

*Means in columns followed by the same letter are not statistically different at the P<0.05 level (Fisher's LSD test).*

**Table 5. DPL 555BR cotton plant mapping data on July 28th, 2005, following plant growth regulator application on July 2, 2005, Blythe, CA.**

| Treatment | Rate/acre | Height | Nodes/ plant | Ht:Node Ratio | Fruiting nodes First | Fruiting nodes per plant |
|---|---|---|---|---|---|---|
| AuxiGro® WP + CalMax® + Foliar Pride | 4.0 oz 1 qt 1 qt | 32.6a | 21.6a | 1.52a | 7.5a | 14.0ab |
| Chaperone™ | 5.0 oz | 34.2a | 23.45a | 1.46a | 6.6a | 16.85a |
| HappyGro™ + PhotoGro | 1.06 oz 1.06 oz | 35.7a | 23.4a | 1.52a | 7.45a | 15.95ab |
| Untreated Check | ----- | 35.1a | 21.15a | 1.66a | 7.85a | 13.3 b |

*Means in columns followed by the same letter are not statistically different at the P<0.05 level (Fisher's LSD test).*

**Table 6. Retention percentages of DPL 555BR cotton on July 13 following plant growth regulator application on July 2, 2005, Blythe, CA.**

| | | Fruiting position on node | | | | |
|---|---|---|---|---|---|---|
| Treatment | Rate/acre | 1st | 2nd | 3rd | 1-2 | 1-3 |
| AuxiGro® WP + CalMax® + Foliar Pride | 4.0 oz 1 qt 1 qt | 50.6a | 59.3a | 59.5a | 54.9a | 56.4a |
| Chaperone™ | 5.0 oz | 55.6a | 58.1a | 52.3a | 56.8a | 55.3a |
| HappyGro™ + PhotoGro | 1.06 oz 1.06 oz | 55.4a | 54.0a | 50.8a | 54.7a | 53.4a |
| Untreated Check | ----- | 62.6a | 68.9a | 66.1a | 65.7a | 65.9a |

*Means in columns followed by the same letter are not statistically different at the P<0.05 level (Fisher's LSD test).*

**Table 7. Retention percentages of DPL 555BR cotton on July 28th following plant growth regulator application on July 2, 2005, Blythe, CA.**

| | | Fruiting position on node | | | | |
|---|---|---|---|---|---|---|
| Treatment | Rate/acre | 1st | 2nd | 3rd | 1-2 | 1-3 |
| AuxiGro® WP<br>+ CalMax®<br>+ Foliar Pride | 4.0 oz<br>1 qt<br>1 qt | 38.1a | 48.8a | 55.7a | 43.4a | 45.0a |
| Chaperone™ | 5.0 oz | 35.4a | 36.7 b | 39.7a | 36.1a | 37.3a |
| HappyGro™<br>+ PhotoGro | 1.06 oz<br>1.06 oz | 42.7a | 41.7ab | 55.3a | 42.2a | 46.6a |
| Untreated Check | ----- | 41.6a | 43.3ab | 51.3a | 42.5a | 45.4a |

*Means in columns followed by the same letter are not statistically different at the P<0.05 level (Fisher's LSD test).*

**Table 8. Mean calculated fruiting structures of DPL 555BR cotton on July 13th following plant growth regulator applications on July 2, 2005, Blythe, CA.**

| | | Fruiting position on node | | | | | Percent of check |
|---|---|---|---|---|---|---|---|
| Treatment | Rate/acre | 1st | 2nd | 3rd | 1-2 | 1-3 | Pos. 1-2 |
| 1-3 | | | | | | | |
| AuxiGro® WP | 4.0 oz | 7.7a | 9.1a | 9.1a | 16.8a | 26.0a | 81.6 |
| 89.3 | | | | | | | |
| + CalMax® | 1 qt | | | | | | |
| + Foliar Pride | 1 qt | | | | | | |
| Chaperone™ | 5.0 oz | 8.3a | 9.0a | 8.4a | 17.4a | 25.7a | 88.8 |
| 88.3 | | | | | | | |
| HappyGro™ | 1.06 oz | 8.5a | 8.2a | 7.8a | 16.7a | 24.5a | 85.2 |
| 84.2 | | | | | | | |
| + PhotoGro™ | 1.06 oz | | | | | | |
| Untreated Check | ----- | 9.4a | 10.2a | 9.4a | 19.6a | 29.1a | ----- |
| ----- | | | | | | | |

*Means in columns followed by the same letter are not statistically different at the P<0.05 level (Fisher's LSD test).*

**Table 9. Mean calculated fruiting structures of DPL 555BR cotton on July 28th following plant growth regulator applications on July 2, 2005, Blythe, CA.**

| | | Fruiting position on node | | | | | % increase |
|---|---|---|---|---|---|---|---|
| Treatment | Rate/acre | 1st | 2nd | 3rd | 1-2 | 1-3 | Pos. 1-2 |
| | | | | | | 1-3 | |
| AuxiGro® WP | 4.0 oz | 5.3a | 6.8a | 7.7a | 12.1a | 19.8a | 7.1 |
| | | | | | | 8.8 | |
| + CalMax® | 1 qt | | | | | | |
| + Foliar Pride | 1 qt | | | | | | |
| Chaperone™ | 5.0 oz | 6.0a | 6.1a | 6.6a | 12.1a | 18.7a | 7.1 |
| | | | | | | 2.7 | |
| HappyGro™ | 1.06 oz | 6.7a | 6.6a | 8.7a | 13.3a | 22.1a | 17.7 |
| | | | | | | 21.4 | |
| + PhotoGro™ | 1.06 oz | | | | | | |
| Untreated Check | ----- | 5.5a | 5.8a | 6.9a | 11.3a | 18.2a | ----- |
| | | | | | | ----- | |

*Means in columns followed by the same letter are not statistically different at the P<0.05 level (Fisher's LSD test).*

**Table 10. Seed cotton, turnout percentages and lint yields per acre of DPL 555BR as affected by various plant growth regulator treatments applied July 2, 2005**

| Treatment | Rate/acre | Seed cotton (lbs.a/cre) | Turnout Percent | Lbs. lint per acre | B/value |
|---|---|---|---|---|---|
| AuxiGro® WP | 4.0 oz | 1,643a | 32.15 | 528ab | 26.66a |
| + CalMax® | 1 qt | | | | |
| + Foliar Pride | 1 qt | | | | |
| Chaperone™ | 5.0 oz | 1,673a | 30.98 | 519 b | 23.01ab |
| HappyGro™ | 1.06 oz | 1,658a | 29.45 | 488 b | 25.05a |
| + PhotoGro™ | 1.06 oz | | | | |
| Untreated Check | ----- | 1,908a | 32.14 | 613a | 21.57 b |

*Means in columns followed by the same letter are not statistically different at the P<0.05 level (Fisher's LSD test).*

**Table 11. DPL 555BR cotton lint quality factor means as affected by various plant growth regulator treatments applied July 2, 2005.**

| Treatment | Rate /acre | Grade | Leaf | Mic | Fiber Length Staple | Fiber Length 1/100" | Strength (g/tex) | Color C Red | Color C+b | Unif | Trash |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AuxiGro® WP<br>+ CalMax®<br>+ Foliar Pride | 4.0 oz<br>1 qt<br>1 qt | 31-1 | 3.0a | 4.60a | 36 | 111a | 31.5a | 80.02a | 7.62a | 79.7c | 2.33b |
| Chaperone™ | 5.0 oz | 31-1.2 | 3.0a | 4.60a | 35 | 110b | 31.1b | 79.7a | 7.60a | 80.5a | 3.0b |
| HappyGro™<br>+ PhotoGro™ | 1.06 oz<br>1.06 oz | 29.3-1.2 | 3.0a | 4.60a | 35 | 111a | 31.1b | 80.15a | 7.77a | 80.5a | 2.67b |
| Untreated Check | ------- | 31-1.6 | 2.7a | 4.86b | 35 | 109c | 30.6c | 79.85a | 7.16b | 80.11b | 1.43a |

*Means in columns followed by the same letter are not statistically different at the P<0.05 level (Fisher's LSD test).*