

# EVALUATION OF PLANT GROWTH REGULATORS ON A MEDIUM TO SHORT COTTON VARIETY

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## Introduction

Fibermax 9063B2RF height and growth habit is characterized as medium to short<sup>1</sup>. In comparison Fibermax 1880B2RF is characterized as medium-tall and having a vigorous growth habit<sup>1</sup>. Plant growth regulators (PGR) are often applied to Fibermax 1880B2RF in an effort to control height. Fibermax 9063B2RF was planted on approximately 58% of the acres in Gaines County and PGRs are often applied during the season. Several PGR are being market for use on cotton. The objectives of this research was to evaluate the performance of commercially available PGRs on a medium to short cotton variety, Fibermax 9063B2RF, in a large plot on-farm trial. Yield and fiber qualities were used to determine the seed yield, lint yield, and lint loan values per acre for each PGR treatment. Additionally, plant mapping was conducted in order to compare plant height and number of nodes under the various applications.

## Materials and Methods

An on-farm field trial was conducted in Gaines County, TX in 2008. The trial was planted on 15 May and had a seeding rate of 3.5 seed per row-foot. The trial was irrigated using a center pivot irrigation system. Plots were 8-rows wide with a 38 inch row-spacing and extended the length of the field. Four plant growth regulators (PGR) and an untreated check were evaluated in the trial (Table 1). Plots were arranged in a randomized complete block design with 3 replications. The production practices were the same for all treatments. The PGRs were applied on 2 July with flat fan nozzles and a spray volume of 16.7 gallons per acre. A pre-treatment, post-treatment and final plant mapping was conducted on 2 July, 23 July, and 2 October, respectively. Plant mapping included plant height and number of nodes for 10 plants per plot. Additionally, nodes above white flower (NAWF) was included in the post-treatment plant mapping on 23 July. The trial was harvested on 12 November. All plots were weighed separately using a Lee weigh wagon. Sub-samples were taken from each plot. All sub-samples were weighed and then ginned using a sample gin with a lint cleaner, burr extractor and stick machine. Ginned lint was weighed and lint and seed turnouts were calculated. Lint yield and seed yield was determine by multiplying the respective turn out with field plot weights. Approximately 50 gram lint samples were randomly collected for fiber quality analysis. Fiber analysis was conducted by the Texas Tech University Fiber & Biopolymer Research Institute and Commodity Credit Corporation (CCC) lint loan values were determined for each plot. Statistical analysis of data was conducted using ARM 8, using LSD.

Table 1. Plant Growth Regulators, Application Rates, and estimated cost per acre.

PGR	Rate/acre	\$/acre
Stance	3 fl oz	\$3.00
Pentia	4 fl oz	\$1.50
Mepex	4 fl oz	\$0.52
Mepex Gin Out	4 fl oz	\$1.19
Untreated Check	-	0

## Results

Table 2. Plant height (Ht), Number (No.) Nodes, and Nodes Above White Flower (NAWF).

Treatment	Rate	Unit	Plant Mapping						
			----- July 2 -----		----- July 23 -----			----- October 2 -----	
			Plant Ht	No. Nodes	Plant Ht <sup>1</sup>	No. Nodes	NAWF	Plant Ht	No. Nodes
Stance	3	fl oz/a	7.10	10.88	12.58 b	15.27	7.27	19.63	21.30
Pentia	4	fl oz/a	6.38	10.20	12.74 b	14.60	6.53	20.43	21.13
Mepex	4	fl oz/a	6.81	10.50	14.04 b	15.37	7.07	19.97	21.30
Mepex Gin Out	4	fl oz/a	6.65	10.23	13.06 b	14.70	6.57	20.53	21.07
Untreated	4	fl oz/a	7.28	10.57	16.43 a	16.00	7.87	23.37	22.10
Test Average			6.84	10.48	13.77	15.19	7.06	20.79	21.38
CV, % <sup>2</sup>			5.68	2.6	6.24	4.26	10.46	6.9	4.82
OSL <sup>3</sup>			0.1195	0.0814	0.003	0.1474	0.2486	0.0743	0.7452
LSD <sup>4</sup>			NS	NS	1.62	NS	NS	NS	NS

<sup>1</sup>Means within a column followed by the same letter do not significantly differ (P=.05, LSD). <sup>2</sup>CV - coefficient of variation. <sup>3</sup>OSL - observed significance level, or probability of a greater F value. <sup>4</sup>LSD - least significant difference at the 0.05 level.

Table 3. Harvest Results.

Treatment	Rate	Unit	Seed turnout	Lint turnout	Seed yield	Lint yield	Lint loan Value <sup>1</sup>
Stance	3	fl oz/a	0.50	0.31	2144.35	1341.64	0.5758 ab
Pentia	4	fl oz/a	0.50	0.32	1968.79	1262.79	0.5773 a
Mepex	4	fl oz/a	0.50	0.32	2029.41	1316.19	0.5787 a
Mepex Gin Out	4	fl oz/a	0.49	0.32	2056.81	1345.10	0.5727 b
Untreated	4	fl oz/a	0.49	0.32	1906.32	1245.57	0.5728 b
Test Average			0.5	0.32	2021.14	1302.26	0.58
CV, % <sup>2</sup>			1.66	1.27	4.25	4.2	0.37
OSL <sup>3</sup>			0.1937	0.1547	0.0712	0.1741	0.0314
LSD <sup>4</sup>			NS	NS	NS	NS	0.004

<sup>1</sup>Means within a column followed by the same letter do not significantly differ (P=.05, LSD). <sup>2</sup>CV - coefficient of variation. <sup>3</sup>OSL - observed significance level, or probability of a greater F value. <sup>4</sup>LSD - least significant difference at the 0.05 level.

Table 4. HVI fiber property results.

Treatment	Rate	Unit	Micronaire	Length	Uniformity	Strength <sup>1</sup>	Elongation	Leaf	Rd <sup>1</sup>	+b
Stance	3	fl oz/a	4.33	1.173	81.07	31.03 ab	8.9	2.3	81.6 a	7.47
Pentia	4	fl oz/a	4.37	1.17	81.1	30.6 bc	9.03	1.7	81.37 a	7.87
Mepex	4	fl oz/a	4.33	1.187	82.03	31.9 a	8.8	2.3	80.83 ab	7.93
Mepex Gin Out	4	fl oz/a	4.5	1.153	80.87	30.7 bc	9.1	2	80.2 b	8.03
Untreated	4	fl oz/a	4.33	1.14	80.57	29.7 c	9.23	2.3	80.27 b	7.93
Test Average			4.37	1.16	81.13	30.79	9.01	2.13	80.85	7.85
CV, % <sup>2</sup>			3.84	2.42	1.09	1.9	3.39	24.21	0.67	4.45
OSL <sup>3</sup>			0.7013	0.3631	0.4027	0.0194	0.4975	0.4609	0.0443	0.3827
LSD <sup>4</sup>			NS	NS	NS	1.10	NS	NS	1.03	NS

<sup>1</sup>Means within a column followed by the same letter do not significantly differ (P=.05, LSD). <sup>2</sup>CV - coefficient of variation. <sup>3</sup>OSL - observed significance level, or probability of a greater F value. <sup>4</sup>LSD - least significant difference at the 0.05 level.

The untreated plant height was significantly taller than the four treatments on July 23, 2008 (Table 2). There were no other dates in which plant height, number of nodes, or Nodes Above White Flower (NAWF) differed (Table 2). There was not a significant difference in seed turnout, lint turnout, seed yield, or lint yield (Table 3). Significant differences were observed in strength and Rd (Table 4).

### **Discussion**

Stance, Pentia, Mepex and Mepex Gin Out performed similarly in this test. These products were applied to a cotton variety that is characterized as medium to short. This was an exceptionally dry and windy year which resulted in slower growth and development. These products may perform differently when precipitation is not a limiting factor. Additionally, results from this trial should not be extended to varieties that are characterized as having a vigorous growth habit. More tests need to be conducted in order to evaluate these products across varieties and across years.

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### **References**

<sup>1</sup>Bayer CropScience FiberMax Cotton on-line Seed Variety Guide for the Southwest.  
[http://www.bayercropscienceus.com/products\\_and\\_seeds/seeds/fibermax.html](http://www.bayercropscienceus.com/products_and_seeds/seeds/fibermax.html)