

TITLE:

Messenger Field Trial on Runner Peanut, Gaines County, Texas, 2001

AUTHOR:

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OBJECTIVE:

Evaluate Messenger harpin protein as a plant growth/plant health regulator applied at different stages of plant growth for runner peanut in West Texas.

Harpin is a naturally occurring protein present in a number of species of plant pathogenic bacteria. The plant hypersensitive response elicited by harpin in several crop plants demonstrates potential for Messenger, a commercial product containing harpin, to improve plant growth and disease resistance. Messenger was applied at multiple application times (or combinations thereof) to determine effects on plant growth and peanut yield under field conditions.

METHODS AND PROCEDURES:

The following trial was conducted at the Western Peanut Growers Assn. research farm in north central Gaines Co., Texas.

Soil Type:	Brownfield loamy sand
Planting:	May 16, 2001, on 36" rows
Previous Crop:	Cotton
Seeding Rate:	~4.5 seeds per row foot with vacuum planter (~85 lbs./A)
Plot Set-up:	RCBD, four reps for each of 12 treatments
Harvest Area:	4-36" rows X 50'
Inoculant:	Urbana FrozenPrep at recommended rate (avg. ~20 nodules/plant)
Fertilizer:	40 lbs. N/A applied with pivot application
Herbicide:	Sonolan
Insecticide:	None
Rainfall:	~3" during the growing season
Irrigation level:	~18" applied in both spray and LEPA during the season
Date Dug:	October 29, 2001
Date Harvested:	November 6, 2001

The experiment was a RCBD with 12 treatments (see table) applied with four replications per treatment. Target spray dates were determined by physiological stages of development. This included C2, pre-bloom, pegging, and late bloom. The early application of Messenger was delayed by 1 week from the recommended application date to allow the plants to grow larger else very little material would have contacted the plants in the spray pattern.

Application was conducted using a backpack sprayer calibrated to deliver 2.25 ounces Messenger per acre at a water rate of ~10 gal/A. Water used to apply Messenger was from the irrigation wells at WPG (i.e., non-chlorinated). Product was applied immediately after mixing and dissolution.

Texas A&M soil tests indicated soil nitrate, 14 ppm (low); phosphorus, 26 ppm (moderate); potassium, 284 ppm (high); calcium, 620 ppm (high); salinity, 440 ppm (none); and soil pH of 7.9. No significant nematode problems were associated with the test.

RESULTS AND DISCUSSION:

Stand counts recorded in mid-June were not significantly different among treatments, averaging 51,700 plants/A. No visual differences among plants were observed above ground. No differences in pod rots or other plant disease incidence were observed, as pod rot levels were less than 1%. No significant insect pressure was observed during the course of the growing season.

Among strips of plots in the field, strip 4 (of 7) appeared to have received less irrigation water, which was confirmed by comparing yields of cotton and peanuts at other locations around the circle. Strip four plots averaged less than 2700 lbs./A and they were removed from the comparison. Thus evaluations were made for only 3 replications for seven of the 12 treatments. Overall, the lack of significant additional rainfall (~7" average in June-August) and lack of full irrigation water due to two of three wells sucking air in August may have limited yields by about 1000 lbs./A.

Table 1. Treatment application dates, timing and days after emergence, yield response, and grade for Messenger on runner peanut, Gaines Co., Texas.

Messenger Treatment	5-Jun After Emergence	2-Jul Pre/Early Bloom	24-Jul Pegging	28-Aug Late Season	Yield (lbs./A)^	Grade % (SMK+SS)
1	Messenger				3415 a	77.5
2		Messenger			3434 a	77.5
3			Messenger		3427 a	77.2
4				Messenger	3642 a	77.5
5	Messenger	Messenger			3619 a	77.5
6	Messenger		Messenger		3469 a	78.9
7	Messenger			Messenger	3445 a	78.5
8		Messenger	Messenger		3086 a	77.3
9		Messenger		Messenger	3470 a	77.3
10			Messenger	Messenger	3694 a	77.2
11	Messenger	Messenger	Messenger	Messenger	3778 a	76.8
12	Control	Control	Control	Control	3753 a	77.4
Treatment Average					3519	77.6
P Value (0.05)					0.621	N/A
Coefficient of Variation (CV), %					10.5	N/A
DAE	14	41	63	98		

^Means in the same column followed by the same letter are not significantly different at the 0.05 significance level.

No significant differences were observed among yields across the 12 treatments when tested at the 0.05 significance level (P value = 0.621). No trends were observed in grade (non-replicated). The coefficient of variation (CV) was 10.5%.

This trial represents only one year of data at one location and should not be used to make long-term conclusions about the effect of Messenger on peanut health and growth. Reliability of trials of this nature increases when tested across multiple locations and different cropping years.