Southeastern Peanut Research Initiative
Final Report

Title: Influence of Gramoxone timings on early, mid, and late-season peanut cultivars

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Funding Period: January 1, 2007 to December 31, 2007

Objectives:

1. Determine if peanut cultivars, with differing maturity timings, vary in relation to sensitivity to Gramoxone.
2. Determine injury mitigation effects of Basagran are required to inhibit yield loss associated with Gramoxone applications.
3. Determine the economic feasibility of the conclusions.

Background:

Gramoxone has been used for many years for early-season weed control in peanuts. Though considered a non-selective herbicide, peanuts possess relatively high levels of tolerance to Gramoxone. Therefore, this inexpensive herbicide option is ideal for many peanut producers.

The current herbicide label allows Gramoxone to be applied postemergence until 28 days after cracking. However, this timeline was developed many years ago using, predominately, the Florunner variety. Florunner was a mid-season variety maturing in approximately 135 days. Since that time, varieties have been developed that mature much faster (such as Virugard and Andru II) and much longer (such as C99R and GA02C). Therefore, at 28 days after cracking, Virugard will be at a much different place, physiologically, than a mid or late-season peanut. The question then remains, is 28 days after cracking an appropriate limit to Gramoxone applications for all peanut cultivars, regardless of maturity level, or should this application window be

shortened for early-season cultivars?

It has also been known for many years that the inclusion of Basagran will effectively reduce peanut injury relative to applying Gramoxone alone. This is even a greater issue now that many producers are attempting to manage tropical spiderwort with Gramoxone + Dual, which causes significantly more injury that Gramoxone alone. Therefore, if the level of injury associated with Gramoxone applications is reducing yield, can the mitigating effects of Basagran effectively reverse the potential yield loss from this injury?

Methods:

Field studies were conducted at Jay and Citra, FL to determine the impact of application timing on early, mid and late-season peanuts. The varieties Andru II, AP 3, and C99R were grown at each location under a conventional tillage regime.

Herbicide treatments will include Gramoxone, Gramoxone + Dual, Gramoxone + Basagran, and Gramoxone + Dual + Basagran. An untreated check plot for each variety was included. These treatments were applied to all three cultivars at 14 and 28 days after cracking. Data on peanut foliar injury, vine length, and days until vines lap row middles were collected for each variety. Four herbicide treatments, 2 application timings, 3 varieties, and an untreated will result in 27 distinct treatments within this experiment.

An abbreviated experiment was conducted at the Tifton location. The varieties GA-02C and GA-03L were grown under a conventional tillage regime. Here Gramoxone was applied at 8 oz/A alone and at and 12 oz/A with Basagran. The applications were made at 7, 14, 21, and 28 days after cracking.

Results:

Tifton, GA. No differences among treatments were observed for either variety at any application timing (Table 1). Even increasing the application rate of Gramoxone to 12 oz/A didn't result in yield reduction. Yields were at or near 3000 lb/A for GA-03L and over 4300 lb/A for GA-02C and peanuts were likely actively growing at the time of the Gramoxone applications.

Jay, FL. Gramoxone did not significantly reduce yield, relative to the untreated, of Andru II or C99R at any application timing (Table 2). A significant yield reduction was observed for the AP3 variety when Gramoxone + Basagran was applied 28 days after treatment (DAT). No explanation can be readily offered for why reduced yield was observed with this treatment and no others.

Citra, FL. Numerous yield reductions, relative to the untreated, were observed at the Citra location (Table 2). Yield reduction at this location was so common that description here in the text would likely be overly laborious. In light of discussing treatment effects, a general discussion will be employed.

The varieties AP3 and C99R at the Citra location yielded approximately 40% less than at the Jay location. This is likely due to the fact that the Citra location was planted with a poor seed lot that expressed reduced germination and vigor; 6 seeds per foot were planted and approximately 4 per foot emerged. Of those that emerged, a devastating level of crown rot disease (caused by *Aspergillus niger*) was observed. Therefore, the entire experiment was abandoned and replanted

on June 14th at a rate of 10 seeds per foot. An acceptable stand was observed with the second planting, but seedling vigor was low. It is our hypothesis that the low vigor seedlings, emerging during a period of extremely high soil and air temperatures, were weakened by the environment and not actively growing at the time of the Gramoxone application. It is assumed that these conditions weakened the peanut and reduced their tolerance to the foliar injury imposed by the Gramoxone application. Conversely, the peanut yields in Jay and Tifton were high for all varieties. It can be assumed that the peanuts at these locations were vigorous at the time of the Gramoxone application and able to withstand the foliar injury.

From this experiment, I would suggest that it is advisable to withhold a Gramoxone application if it is to be made during adverse growing conditions when peanuts are less likely to rapidly recover from the injury. Additionally, these data suggest that the addition of Basagran with Gramoxone will not alleviate the yield reducing effects of Gramoxone. Therefore, if yield penalty from a Gramoxone application is likely, it is best to withhold the Gramoxone entirely than to apply it in conjunction with Basagran.

Table 1. Peanut yield response to Gramoxone combinations applied from 7 to 28 days after cracking.

			Tifton, GA	
Herbicide	Rate (oz/A)	Appl. timing	GA-02C	GA-03L
			Yield (lb/A)	
Gramoxone	8	7 DAC	4550 a	3450 a
Gramoxone	8	14 DAC	4400 a	3050 a
Gramoxone	8	21 DAC	4400 a	2975 a
Gramoxone	8	28 DAC	4850 a	3250 a
Gramoxone + Basagran	12 + 8	7 DAC	4300 a	3300 a
Gramoxone + Basagran	12 + 8	14 DAC	4400 a	3250 a
Gramoxone + Basagran	12 + 8	21 DAC	4550 a	3350 a
Gramoxone + Basagran	12 + 8	28 DAC	4300 a	3200 a
Untreated			4550 a	3200 a

Table 2 Peanut yield response to Gramoxone combinations applied at 14 and 28 days after cracking.

			Citra, FL			Jay, FL		
Herbicide	Rate (oz/A)	Application timing	Andru II	AP3	C99R	Andru II	AP3	C99R
			Yield (lb/A)					
Gramoxone	8	14 DAC	2500 b	2400 ab	2675 ab	4150 ab	4350 ab	4725 bc
Gramoxone + Basagran	8 + 8	14 DAC	2700 b	2550 a	2450 bc	4800 a	3875 b	5800 a
Gramoxone + Dual Magnum	8 + 21	14 DAC	2700 b	2475 ab	2525 bc	4000 bc	3925 b	5000 b
Gramoxone + Dual Magnum + Basagran	8 + 21 + 8	14 DAC	2750 b	2552 a	2525 bc	3600 bc	4300 ab	5000 ab
Gramoxone	8	28 DAC	2000 c	2413 ab	1900 d	3300 c	3825 b	4350 b-d
Gramoxone + Basagran	8 + 8	28 DAC	2775 b	2300 b	2625 b	3225 c	2625 c	4050 cd
Gramoxone + Dual Magnum	8 + 21	28 DAC	2625 b	2250 b	2325 c	3675 bc	3950 b	4700 bc
Gramoxone + Dual Magnum + Basagran	8 + 21 + 8	28 DAC	2800 ab	2625 a	2950 a	3375 c	4650 a	3700 d
Untreated			3100 a	2425 ab	2725 ab	3450 bc	4350 ab	4400 b-d