TITLE:

Rotational Cotton Response to Pursuit and Cadre

AUTHORS:

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MATERIALS AND METHODS:

Plot Size:	4 rows by 30 feet
Soil Type:	Brownfield loamy fine sand
Planting Date:	June 3, 2002
Variety:	PM 2280 BG/RR
Irrigation/rainfall:	Post-application to Preplant = 1.7 inches In-season = 26.95 inches
Application Date:	April 18, 2002
Harvest Date:	November 20, 2002

RESULTS AND DISCUSSION:

Imazapic (Cadre) and imazethapyr (Pursuit) control a broad spectrum of broadleaf weeds and have activity on yellow and purple nutsedge. These imidazolinone herbicides, like others that belong to this herbicide family (e.g. Arsenal) have significant soil residual activity that may injure rotational crops. Cotton, which is susceptible to residues of imazapic and imazethapyr, is commonly rotated with peanut in Texas and across other peanut production regions. The objective of this experiment was to evaluate cotton response (stand, visual injury, yield) to various soil residual concentrations of imazapic and imazethapyr.

No reduction in cotton stand was observed throughout the growing season regardless of herbicide rate. In addition, time to emergence was not affected by either herbicide at any rate (data not shown).

Cadre at 0.001 to 0.032 lb ai/A injured cotton at every rating date. Injury increased as Cadre rate increased. Injury ranged from 37 to 85% on June 26 (23 days after planting), 25 to 88% on July 10 (37 days after planting), 24 to 92% on July 25 (52 days after planting), 11 to 75% on August 7 (65 days after planting), and 17 to 40% on September 18 (107 days after planting). Cotton yield was reduced in plots treated with 0.032 lb ai/A Cadre, but all other plots, despite the visual injury observed, yielded similar to the non-treated control.

Cotton injury following Pursuit was less than or equal to Cadre at each herbicide rate. Injury ranged from 32 to 89% on June 26 (23 days after planting), 10 to 82% on July 10 (37 days after planting), 16 to 84% on July 25 (52 days after planting), 5 to 58% on

August 7 (65 days after planting), and 5 to 27% on September 18 (107 days after planting). At the end of the season, only the lowest rate of Pursuit (0.001 lb ai/A) did not cause injury greater than 10%. All plots treated with Pursuit yielded similar to the non-treated control.

This data is similar to the data collected in 2001 with few exceptions. First, cotton sustained greater injury in 2001 when compared to injury observed in 2002. We believe this was the result of more rainfall/irrigation between application and planting. Secondly, as a result of the severe injury reported in 2001, some plots did not produce cotton. Thirdly, it appears that visual cotton injury may not be a good predictor of yield reduction observed at the end of the season. In 2001, soil analyses were conducted but could not detect Cadre or Pursuit in the soil (in parts per million, PPM); however, severe cotton injury was observed. This would indicate that plants (cotton) have a greater ability to extract Cadre and Pursuit from the soil than current laboratory procedures. The current restrictions on the Cadre and Pursuit label prohibit planting cotton for 18 months after application, which suggests that cotton is very susceptible to Cadre and Pursuit residues in the soil.

Table 1. Cotton response to Cadre and Pursuit residues in the soil at the Western Peanut Growers Research Farm in 2002.

Treatment	Rate	--------- Cotton Injury (%) ---------					Cotton Lint Yield (lb/A)
		6/26	7/10	7/25	8/9	9/18	11/20
Non-treated	0	0	0	0	0	0	740
Cadre	0.032	85	88	92	75	40	358
Cadre	0.016	73	78	70	45	23	718
Cadre	0.008	54	47	48	24	17	910
Cadre	0.004	54	41	22	19	13	870
Cadre	0.002	43	23	19	10	8	812
Cadre	0.001	37	25	24	11	17	768
Pursuit	0.032	89	82	84	58	27	625
Pursuit	0.016	77	72	68	43	18	695
Pursuit	0.008	64	58	52	14	15	871
Pursuit	0.004	53	30	27	12	15	983
Pursuit	0.002	33	13	12	2	13	789
Pursuit	0.001	32	10	16	5	5	853
$LSD_{(0.05)}$		16	12	15	9	10	296