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**MEETING HOST:**



## Poster #50

### Weed Management During and After Rhizoma Perennial Peanut Establishment

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#### ABSTRACT.

Beef and dairy enterprises are among the most economically important agricultural activities through the Caribbean Islands of the US. Rhizoma perennial peanut is currently being considered in the Caribbean as an alternative forage because of its low requirements for nitrogen fertilization, relatively high protein content, adaptability to contrasting ecological areas and low susceptibility to pests. The objective was to evaluate strategies to control weeds during and after rhizoma perennial peanut establishment. Four herbicide treatments of imazethapyr and dimethenamid were evaluated. Predominant weeds were junglerice, purple nutsedge, horse purslane, wild poinsettia and common purslane. Differences were detected for dry weight of the peanut and weeds among herbicides treatments at establishment. After establishment, evaluations indicated the best weed control was obtained on the early application dates.

**KEYWORDS:** rhizome perennial peanut, weeds

#### INTRODUCTION

Beef and dairy enterprises are among the most economically important agricultural activities through the Caribbean Islands of the US. There is considerable interest in this area to improve production and quality of forages. Rhizoma perennial peanut (RPP) (*Arachis glabrata*) is currently being considered in the Caribbean as an alternative forage because of its low requirements for nitrogen fertilization, relatively high protein content, adaptability to contrasting ecological areas and low susceptibility to pests. The response of weeds and rhizoma perennial peanut to imazethapyr and dimethenamid in tropical and sub tropical conditions are unknown. Thus, the objective of this study was to evaluate strategies to control weeds during and after RPP establishment.

#### MATERIALS AND METHODS

A field experiment was established at Juana Díaz, Puerto Rico. The soil was a Mollisols with a pH of 7.7. Two RPP accessions, USDA 17033 and USDA 17095, were used. Plot size was 4.57m x 6.0 m and consisted of five rows 0.76 m apart. Planting material was freshly dug rhizomes that were planted continuously in the row at 10-cm depth.

Herbicide treatments were: 1)-imazethapyr at 0.070 kg ai/ha, preemergence (PRE); 2)-dimethenamid at 1.68 kg ai/ha – PRE; 3)-dimethenamid at 3.36 kg ai/ha – PRE; and 4)-imazethapyr at 0.070 kg ai/ha early postemergence (early POE, applied 16 days after planting). Preemergence herbicide treatments were applied the day after planting with a

portable CO<sub>2</sub> pressured backpack sprayer delivering 187 L/ha. Treatments were arranged in a RCBD with four reps. To ensure plant survival, plots were uniformly irrigated with sprinklers the day after the PRE herbicides treatments were applied.

After herbicides treatments, and to complete weed management until RPP establishment, plots received uniformly bromoxynil at 0.28 kg ai/ha 4, 8, 11 weeks after planting and clethodim at 0.28 kg ai/ha at: 4, 11, 24, 31 WAP. By week 42 after planting, glyphosate at rate mix of 20:1 water:herbicide was applied with a weed wiper adjusted 40 cm above the ground.

*Data and Analyses:* Data for analyses included: 1)-Weed dry weight and RPP were evaluated, 6 six and 12 months after planting. 2)-Relative yield among plots at 7 and 13 weeks after the leveling cut (2 years after planting). All data were subjected to analysis of variance, and means were separated using the Tukey's test at the  $P \leq 0.05$  level.

## RESULTS AND DISCUSSION

Predominant weeds were junglerice (*Echinochloa colona*), purple nutsedge (*Cyperus rotundus*), horse purslane (*Thrianthema portulacastrum*), wild poinsettia (*Euphorbia heterophylla*) and common purslane (*Portulaca oleracea*).

*Dry weight of weeds and RPP yield during establishment* (Table 1): Differences were detected for dry weight of RPP and weeds among herbicides treatments at establishment (Table 1). Those plots receiving imazethapyr as an early postemergence had 44 g/m<sup>2</sup> more dry weight of weeds than dimethenamid at the lowest rate, but not significant differences were found among the other treatments. The lowest weight of RPP as compared with the other three herbicide treatments, was that with imazethapyr early POE (Table 1). No difference was observed when comparing dimethenamid at the two rates. No differences were detected for dry weight of RPP and weeds among herbicide treatments at six months nor at 12 months after harvest.

*Dry weight of weeds and RPP yield after establishment* (Table 2): Imazethapyr early POE was not as effective as the rest of the treatments in controlling weeds. As a response to imazethapyr early POE, RPP yield was significantly lower (Table 2). Overall, taking into account all rates and dates of herbicide applications, the best weed control was obtained on the early application dates. A prior study by Ruiz et al. (2000), indicated high yield of the RPP when high doses of imazethapyr were combined with appropriate irrigation.

**Table 1.** Dry weight of rhizoma perennial peanut and weeds during the establishment at Juana Díaz, Puerto Rico <sup>1</sup>

Herbicide Treatment	Rate kg ai/ha	Dry weight of peanut		Dry weight of weeds	
		----- g/m <sup>2</sup> -----		----- g/m <sup>2</sup> -----	
Imazethapyr PRE <sup>2</sup>	0.07	203.6	a	54.7	ab
Imazethapyr – early POE	0.07	92.6	b	77.1	a
Dimethenamid PRE	1.68	286.2	a	32.9	b
Dimethenamid PRE	3.36	203.2	a	64.2	ab

<sup>1</sup> Means within a column followed by the same letter are not significantly different according to Tukey's at the P < 0.05 probability level.

<sup>2</sup> PRE = preemergence; early POE = early postemergence.

**Table 2.** Dry weight of weeds and yield of rhizoma perennial peanut after two years of establishment at Juana Díaz, Puerto Rico on 2005 <sup>1</sup>.

Herbicide Treatment	Rate kg ai/ha	----- Dry matter -----					
		Weeds		Perennial peanut			
		----- g/m <sup>2</sup> -----		----- g/m <sup>2</sup> -----			
				7 WAL		13 WAL	
Imazethapyr PRE	0.07	90.3	a	509.9	a	826.3	a
Imazethapyr- early POE	0.07	210.8	b	307.9	b	290.1	b
Dimethenamid PRE	1.68	56.5	a	719.7	a	1001.7	a
Dimethenamid PRE	3.36	91.8	a	538.7	b	997.8	a

<sup>1</sup> Means within a column followed by the same letter are not significantly different according to Tukey's at the P < 0.05 probability level

## REFERENCES

Ruiz, T.M., R. Ramos-Santana and A. Sotomayor-Rios. 2000. Establishment of rhizoma perennial peanut (*Arachis glabrata*) under irrigation at two semiarid sites in the Caribbean. J. Agric. Univ. of PR. 84:105-114.

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