EFFECTS OF ELEVEN HERBICIDES ON THE VEGETATIVE ESTABLISHMENT OF ADALAYD SEASHORE PASPALUM

by

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Seashore paspalum (*Paspalum vaginatum* Swartz) is adapted to and found in many of the tropical-subtropical regions of the world. It can be found growing primarily along coastal areas from North Carolina to Florida to Texas and is being considered for use in many other areas where high soil pH and salinity levels cause problems in the culture of conventionally adapted turfgrass species. This interest in the use of seashore paspalum prompted an evaluation of pesticide tolerances of this species; and more specifically, tolerances to various herbicides that might be used during its vegetative establishment. The cultivar of seashore paspalum used in this study was Adalayd.

MATERIALS AND METHODS

A 465 m^2 (5,000 sq ft) area of Lufkin fine sandy loam was modified by mixing a medium textured, washed sand at a rate of 8.2 m^3/100 m^2 (10 cu yd/1,000 sq ft) to a depth of 150 mm (6 inches). This area was subsequently fumigated with methyl bromide and stolonized with seashore paspalum at a rate of 0.36 m^3/100 m^2 (10 bushels /1,000 sq ft). An application of 13-13-13 fertilizer was made prior to planting, at a rate of 0.75 kg/100 m^2 (1.5 lb/1,000 sq ft) each of N, P_2O_5 and K_2O.

The area was stolonized on April 26, 1984, and the herbicides applied on May 23, 1984. The turf was approximately 50% established at the time the herbicides were applied. Herbicides were selected for this study based on current use for weed control in sod production and, also, on the possibility of their use in the future. A list of materials applied is shown in Table 1.

Table 1. Eleven herbicides and associated rates applied during the vegetative establishment of Adalayd seashore paspalum.

Herbicide Treatment (generic/trade names)	Formulation*	Application Rate	
		lbs A.I./acre	kg A.I./ha
Asulam (Asulox)	3.34F	2.1	2.35
Atrazine (Aatrex)	80W	2.0	2.24
Benefin (Balan)	2.5G	3.0	3.36
Bensulide (Betasan)	4EC	10.0	11.20
Ethofumesate (Progress)	1.5 EC	2.0	2.24
Metribuzin (Sencor)	50W	0.5	0.56
MSMA (Daconate)	6EC	3.0	3.36
Oxadiazon (Ronstar)	2G	2.0	2.24
Pronamide (Kerb)	50W	0.75	0.84
Sethoxydim (Poast)	1.5EC	0.50	0.56
Simazine (Princep)	8W	2.0	2.24
Untreated check		----	----

*Legend: EC - emulsifiable concentrate; F - flowable liquid; G - granule; W - wettable powder

The herbicides were applied using a small hand-held, CO_2 pressurized plot sprayer. Materials were sprayed in a volume of water equivalent to 672 liters/ha (72 gal/acre) at 30 psi. The individual plot size was 1.8 x 2.4 m (6 x 8 ft). All treatments were replicated three times in a randomized block design.

Establishment ratings were initiated two days after application of the herbicides and continued at 8, 16, 30, and 44 days after treatment. Phytotoxicity ratings were taken 6, 14, and 28 days after treatment.

RESULTS

The use of bensulide, oxadiazon, and pronamide during the vegetative establishment of Adalayd seashore paspalum caused no discernable visual antagonistic effects on turf establishment (Table 2) and produced no significant visual phytotoxic symptoms to the shoots (Table 3).

Benefin and ethofumesate caused a slight discoloration of the leaves; and both materials tended to induce a slight delay in vegetative turf establishment.

Turfs treated with asulam showed an increasing degree of phytotoxicity through the fourth week following application and then began to show signs of slow turf recovery.

Table 2. Effects of eleven herbicides on the establishment rate of Adalayd seashore paspalum.

Herbicide Treatment	Percent Turfgrass Cover*				
	5/25/84	5/31/84	6/8/84	6/22/84	7/6/84
Oxadiazon	53 a**	55 a	87 a	100 a	100 a
Pronamide	52 a	52 abc	80 ab	97 a	100 a
Bensulide	50 a	55 a	80 ab	95 a	100 a
Ethofumesate	52 a	53 ab	68 b	82 a	100 a
Untreated check	45 a	57 a	85 ab	97 a	100 a
MSMA	40 a	33 bc	37 c	68 b	99 a
Benefin	55 a	53 ab	75 ab	92 a	98 a
Sethoxydim	38 a	32 c	18 d	25 c	84 a
Metribuzin	45 a	3 d	4 de	4 cd	62 b
Asulam	43 a	40 abc	40 c	26 c	55 b
Simazine	52 a	40 abc	20 d	5 d	25 c
Atrazine	46 a	2 d	0 e	0 d	5 d

* Percent turfgrass cover was visually estimated.
** Values in a column followed by the same letter are not significantly different at the 5% level of Duncan's Multiple Range Test.

Table 3. Evaluation of eleven herbicides for their phytotoxic effects on Adalayd seashore paspalum.

Herbicide Treatment	Shoot Phytotoxicity Ratings*		
	5/31/84	6/8/84	6/22/84
Untreated check	1.0 a**	1.0 a	1.0 a
Pronamide	1.0 a	1.0 a	1.0 a
Oxadiazon	1.0 a	1.3 a	1.0 a
Bensulide	1.7 a	1.3 a	1.0 a
MSMA	7.7 de	5.3 c	1.3 ab
Benefin	1.0 a	2.0 ab	3.0 b
Ethofumesate	1.0 a	3.3 b	3.0 b
Sethoxydim	6.3 cd	8.3 d	8.0 c
Asulam	4.0 b	6.5 c	9.0 c
Simazine	5.7 bc	8.0 d	9.0 c
Atrazine	9.0 e	9.0 d	9.0 c
Metribuzin	9.0 e	9.0 d	9.0 c

* Ratings based on 1 = no phytotoxicity; 9 = severe phytotoxicity.
** Values in a column followed by the same letter are not significantly different at the 5% level of Duncan's Multiple Range Test.

Sethoxydim produced very adverse effects on the appearance and growth of Adalayd seashore paspalum, which worsened with time. The effects of sethoxydim were not terminal, and the Adalayd exhibited a significant degree of turf recovery by the last rating date.

When treated with MSMA, an immediate burning of the shoots occurred and there was a noticeable decline in leaf growth for several weeks. However, these turfs had almost fully recovered by the final rating date.

Metribuzin produced immediate adverse effects on the appearance and establishment of seashore paspalum. However, these turfs had shown significant recovery at the last rating period. Regrowth from the edges of and within each metribuzin-treated plot supports the assumption that there was little or no residual toxicity from this compound.

The symmetrical triazines were the most phytotoxic to the growth and development of Adalayd seashore paspalum (Table 3). The adverse effects of atrazine were more pronounced than those produced by simazine. However, both herbicides showed significantly greater residual toxicity than the other herbicides evaluated (Table 2). The final rating of percent cover indicated some regrowth capabilities in soils treated with the triazines. This regrowth from the triazine-treated areas was measured from ten 100 mm (4-inch) turf plugs of seashore paspalum that had been replanted after the herbicide treatments.

SUMMARY

This study was conducted to determine specific herbicide tolerances on seashore paspalum during vegetative establishment for sod production.

When applied at the recommended rate, bensulide, oxadiazon, and pronamide showed no interference with vegetative turf establishment of Adalayd seashore paspalum. Even though producing a very slight phytotoxicity, benefin and ethofumesate could be used safely during establishment of Adalayd seashore paspalum.

Based on the results of this study, herbicides that should not be used on Adalayd seashore paspalum include: asulam, atrazine, simazine, metribuzin, MSMA, and sethoxydim.

1. Beard, J.B, S.M. Batten, S.R. Reed, K.S. Kim, and S.D. Griggs. 1982. A preliminary assessment of Adalayd seashore paspalum (*Paspalum vaginatum*) for turfgrass characteristics and adaptation to Texas conditions. Texas Turfgrass Research - 1982. Texas Agric. Exp. Sta. PR-4039. pp. 33-34.

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