

BETAMIX®, PROGRESS®, AND BETANEX® FORMULATIONS FOR WEED CONTROL IN SUGAR BEETS

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Introduction

Pressure from the U.S. Environmental Protection Agency to remove one of the carriers from the current formulations of Betamix, Progress, and Betanex has lead Aventis to produce formulations of these products that use a plant-based oil as a carrier. These oil-based formulations need to be compared to current formulations to determine if sugar beet tolerance and weed control efficacy are similar.

Methods

Experimental oil-based formulations of Progress, Betamix, and Betanex were compared to commercial formulations for sugar beet tolerance and weed control efficacy.

Both the experimental and commercial formulations were applied alone at 4.0 oz ai/acre and in a micro-rate treatment at 1.28 oz ai/acre in combination with UpBeet (0.063 oz ai/acre), Stinger (0.5 oz ai/acre), and Scoil (methylated seed oil) (1.5 percent v/v). The experimental and commercial formulations were applied alone three times with the first application to cotyledon beets, the second to two-leaf beets, and the third to eight-leaf beets. The applications were made on April 25, May 3, and May 17. The micro-rate treatments were applied four times with the first application to cotyledon beets on April 25, two-leaf on May 3, four-leaf on May 8, and eight-leaf on May 17.

Results and Discussion

Sugar beet injury ranged from 14 to 32 percent on May 12 and did not differ between experimental oil-based formulations and commercial formulations of Progress, Betamix, or Betanex (Table 1). The experimental formulations also displayed similar injury compared to their respective commercial formulations when applied in a micro-rate with Upbeet, Stinger, and Scoil. Sugar beet injury was not significant after June 25.

In general, weed control was similar between the experimental oil-based and commercial formulations whether applied alone or in the micro-rate treatment (Table 2). The only differences were observed with common lambsquarters control evaluated on June 25. The commercial formulations of Progress and Betanex provided greater control of common lambsquarters than did their respective experimental oil-based formulations.

Sugar beet yields were similar with the experimental oil-based formulations compared to their respective commercial formulations (Table 1). Sugar beet root yields ranged from a low of 31 ton/acre with the experimental oil-based formulation of Progress applied alone to a high of 46 ton/acre with the micro-rate treatment containing the commercial Betanex formulation.

Table 1. Sugar beet injury and yield with experimental and commercial Progress, Betamix, and Betanex formulations, Malheur Experiment Station, Oregon State University, Ontario, OR, 2001.

Treatment	Rate	Timing*	Injury				Sugar beet yield
			5-12	5-24	6-4	6-25	
	oz ai/acre	Leaf	-----%-----				ton/acre
New Progress	4.0	Cot	22	25	23	2	31
New Progress	5.28	2-leaf					
New Progress	5.28	8-leaf					
Progress	4.0	Cot	23	21	14	0	38
Progress	5.28	2-leaf					
Progress	5.28	8-leaf					
New Progress + UpBeet + Stinger + Scoil	1.28 + 0.063 + 0.5 + 1.5% v/v	Cot, 2, 4, 8-leaf	17	17	9	0	41
Progress + UpBeet + Stinger + Scoil	1.28 + 1.0 + 0.5 + 1.5% v/v	Cot, 2, 4, 8-leaf	22	20	19	0	41
New Betamix	4.00	Cot	25	21	18	3	37
New Betamix	5.28	2-leaf					
New Betamix	5.28	8-leaf					
Betamix	4.0	Cot	30	23	20	0	35
Betamix	5.28	2-leaf					
Betamix	5.28	8-leaf					
New Betamix + UpBeet + Stinger + Scoil	1.28 + 0.063 + 0.5 + 1.5% v/v	Cot, 2, 4, 8-leaf	17	18	17	0	40
Betamix + UpBeet + Stinger + Scoil	1.28 + 0.063 + 0.5 + 1.5% v/v	Cot, 2, 4, 8-leaf	19	20	15	3	43
New Betanex	4.0	Cot	21	19	12	0	41
New Betanex	5.28	2-leaf					
New Betanex	5.28	8-leaf					
Betanex	4.0	Cot	14	17	15	5	43
Betanex	5.28	2-leaf					
Betanex	5.28						

8-leaf

New Betanex + UpBeet + Stinger + Scoil	1.28 + 0.063 + 0.5 + 1.5% v/v	Cot, 2, 4, 8- leaf	24	22	19	3	45
Betanex + UpBeet + Stinger + Scoil	1.28 + 0.063 + 0.5 + 1.5 % v/v	Cot, 2, 4, 8- leaf	32	24	20	0	46
Untreated	--	--	0	0	0	0	16
LSD (0.05)			11	10	10	NS	10

*Applications were made to cotyledon (Cot) sugar beets on April 25, two-leaf (2-leaf) May 3, four-leaf (4-leaf) May 8, and eight-leaf (8-leaf) on May 17.

Table 2. Weed control with experimental and commercial Progress, Betamix, and Betanex formulations, Malheur Experiment Station, Oregon State University, Ontario, OR, 2001.

Treatment	Rate	Timing*	Weed control					
			Redroot pigweed		Common lambsquarters		Hairy nightshade	
			6-4	6-25	6-4	6-25	6-4	6-25
	oz ai/acre	Leaf	----- % -----					
New Progress	4.0	Cot	86	43	98	87	89	61
New Progress	5.28	2-leaf						
New Progress	5.28	8-leaf						
Progress	4.0	Cot	90	64	98	98	91	72
Progress	5.28	2-leaf						
Progress	5.28	8-leaf						
New Progress + UpBeet + Stinger + Scoil	1.28 + 0.063 + 0.5 + 1.5% v/v	Cot, 2, 4, 8-leaf	98	84	100	100	100	97
Progress + UpBeet + Stinger + Scoil	1.28 + 1.0 + 0.5 + 1.5% v/v	Cot, 2, 4, 8-leaf	97	78	100	97	96	91
New Betamix	4.00	Cot	91	74	99	98	89	70
New Betamix	5.28	2-leaf						
New Betamix	5.28	8-leaf						
Betamix	4.0	Cot	94	74	100	95	87	65
Betamix	5.28	2-leaf						
Betamix	5.28	8-leaf						
New Betamix + UpBeet + Stinger + Scoil	1.28 + 0.063 + 0.5 + 1.5% v/v	Cot, 2, 4, 8-leaf	96	83	100	100	97	92
Betamix + UpBeet + Stinger + Scoil	1.28 + 0.063 + 0.5 + 1.5% v/v	Cot, 2, 4, 8-leaf	99	92	100	100	99	97
New Betanex	4.0	Cot	99	91	100	92	88	68
New Betanex	5.28	2-leaf						
New Betanex	5.28	8-leaf						

Betanex Betanex Betanex	4.0 5.28 5.28	Cot 2-leaf 8-leaf	99	95	99	100	91	77
New Betanex + UpBeet + Stinger + Scoil	1.28 + 0.063 + 0.5 + 1.5% v/v	Cot, 2, 4, 8- leaf	99	97	98	100	99	98
Betanex + UpBeet + Stinger + Scoil	1.28 + 0.063 + 0.5 + 1.5 % v/v	Cot, 2, 4, 8- leaf	99	97	99	100	99	100
Untreated	--	--	0	0	0	0	0	0
LSD (0.05)			7	25	2	7	12	29

*Applications were made to cotyledon (Cot) sugar beets on April 25, two-leaf (2-leaf) May 3, four-leaf (4-leaf) May 8, and eight-leaf (8-leaf) on May 17.