EVALUATIONS OF SPRING HERBICIDE APPLICATIONS TO DORMANT MINT

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Introduction

Weed control in mint is essential in order to maintain high mint oil yields and quality. Reducing competition from weeds may prolong the productive life of a mint stand. Herbicides are important tools for controlling weeds in mint. With the constant loss of herbicides that are registered for use in mint, it is critical to identify replacements that will provide similar weed control. Several new herbicides that have recently become available or may be available in the near future have been tested in mint. This research evaluated herbicides that have been used traditionally with new herbicide combinations containing some recently registered herbicides including Spartan® (sulfentrazone), Chateau® (flumioxazin), and Command® (clomazone).

Materials and Methods

Two trials were established to evaluate spring herbicide applications to dormant mint for mint tolerance and weed control efficacy. One trial was established near Nampa, Idaho and the other near Nyssa, Oregon. Perennial weed problems and a poor mint stand resulted in abandonment of the Oregon location. Herbicides that were evaluated included a standard of Sinbar®, Karmex®, Stinger®, and Prowl® compared to various combinations that included Spartan, Chateau, and Command. Treatments were applied March 3, 2004 when mint was still mostly dormant. Herbicide treatments were arranged in a randomized block design with four replicates. Plots were 10 ft wide by 30 ft long. Herbicides were applied with a CO_2-pressurized backpack sprayer calibrated to deliver 20 gal/acre at 30 psi. Visual evaluations of mint injury and weed control were made throughout the season. Mint yield was determined by harvesting mint from 3 yd^2 from the center of each plot. After the mint fresh weight was recorded, a 20-lb sub-sample was taken and allowed to dry in burlap bags. Once samples were dry, mint oil was extracted at the University of Idaho mint research still. Distillation was done according to the Mint Industry Research Council (MIRC) protocol.

Results and Discussion

Only the treatment containing Command, Spartan, and Stinger caused significant mint injury on April 27 (Table 1). The same combination with Spartan at a lower rate caused significantly less mint injury, as did the combination of Command, Spartan, and Gramoxone®. By June 7, no significant injury was visible for any treatment. Prickly lettuce populations were variable, and variability among prickly lettuce control

evaluations resulted in no statistical differences among herbicide treatments. Kochia densities were too low for visual control evaluation, but counts of all the kochia in each plot revealed that all but two treatments significantly reduced kochia numbers compared to the untreated check. The combination of Sinbar, Karmex, Stinger, and Chateau and the combination of Command, Chateau, and Gramoxone did not significantly reduce kochia numbers. Mint fresh weight and oil yields were strongly correlated with prickly lettuce control and kochia densities (Fig. 1). All treatments increased mint yield compared to the untreated control. The combination of Command, Chateau, and Gramoxone produced lower mint fresh weight and oil yields than all other treatments except combinations of Command, Spartan, and Gramoxone, but had similar oil yields compared to the combination of Sinbar, Karmex, Singer, and Prowl.

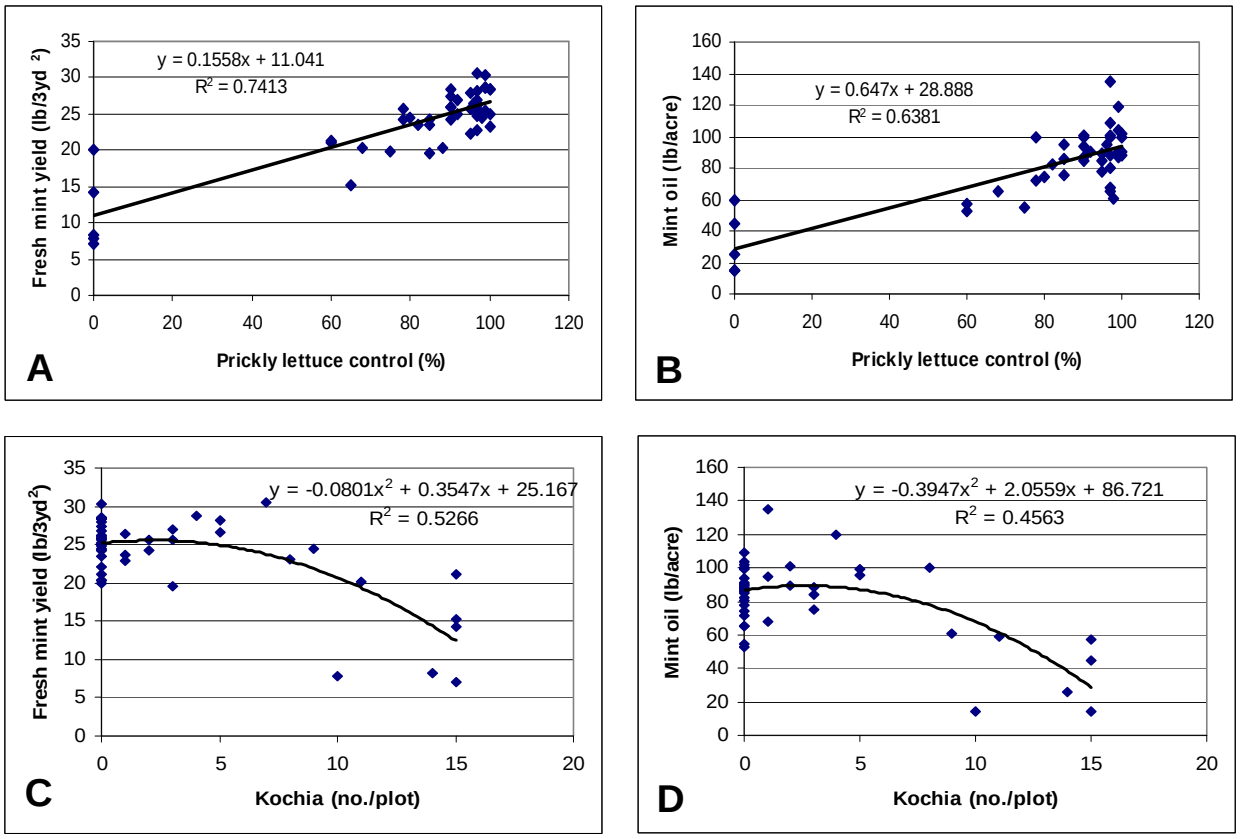

Figure 1. Mint fresh hay and oil yield as influenced by prickly lettuce control (A and B) and kochia density (C and D) in Nampa, ID, Malheur Experiment Station, Oregon State University, Ontario, OR, 2004. For all regressions $P < 0.0000$.

Table 1. Mint injury and weed control from spring herbicide applications to dormant peppermint in Nampa, ID, Malheur Experiment Station, Oregon State University, Ontario, OR, 2004.

				Weed control			Kochia	Mint yield	
		Mint injury		Prickly lettuce			density[‡]	Fresh Wt.	Oil
Treatment*	Rate[†]	4-27	6-7	4-27	6-7	7-28	7-28	8-25	8-25
	lb ai/acre	---------- % ----------					no/plot	lb/3 yd^2	lb/acre
Untreated control	--	-	-	-	-	-	13 a	8.7	28
Sinbar + Karmex + Stinger + Prowl + NIS	0.6 + 0.8 + 0.124 + 1.5 + 0.25%	3	5	84	86	87	2 b	19.5	82
Sinbar + Karmex + Stinger + Spartan + NIS	0.6 + 0.8 + 0.124 + 0.188 + 0.25%	0	3	96	94	96	0 b	21.0	95
Sinbar + Karmex + Stinger + Chateau + NIS	0.6 + 0.8 + 0.124 + 0.125 + 0.25%	5	4	94	94	98	5 ab	20.8	96
Command + Spartan + Stinger + NIS	0.375 + 0.188 + 0.124 + 0.25%	21	5	81	84	90	0 b	21.0	103
Command + Chateau + Stinger + NIS	0.375 + 0.125 + 0.124 + 0.25%	5	4	95	92	95	4 b	21.6	84
Command + Spartan + Gramoxone Extra + NIS	0.375 + 0.188 + 0.375 + 0.25%	8	4	70	66	83	4 b	18.9	77
Command + Chateau + Gramoxone Extra + NIS	0.375 + 0.125 + 0.375 + 0.25%	4	4	59	58	59	8 ab	15.1	58
Sinbar + Karmex + Stinger + Spartan + NIS	0.6 + 0.8 + 0.124 + 0.125 + 0.25%	6	4	92	90	89	2 b	19.4	92
Command + Spartan + Stinger + NIS	0.375 + 0.125 + 0.124 + 0.25%	9	5	91	89	94	1 b	22.2	97
Command + Spartan + Gramoxone Extra + NIS	0.375 + 0.125 + 0.375 + 0.25%	4	5	76	60	78	0 b	19.0	74
Command + Spartan + Stinger + Buctril + NIS	0.375 + 0.125 + 0.124 + 0.25 + 0.25%	3	5	83	86	93	1 b	20.6	96
LSD (0.05)		10	NS	NS	NS	NS	-	4.1	24

*Treatments were applied March 3, 2004 to dormant mint.
[†]Herbicide rates are lb ai/acre. NIS (nonionic surfactant, Activator 90) was applied at 0.25 percent v/v.
[‡]Mean separation is based on transformed data. Raw data are presented.