Proc. Fla. State Hort. Soc. 124:212–213. 2011.

Use of Preemergence Herbicides for Weed Control in Rye Grass Cover Crops between Watermelon Rows†

Peter J. Dittmar*[1] and Robert Hochmuth[2]

[1]University of Florida, IFAS, Horticultural Sciences Department, PO Box 110690, Gainesville, FL 32611-0690

[2]University of Florida, IFAS, North Florida Research and Education Center, Suwannee Valley, 7580 County Road 136, Live Oak, FL 32600

Additional index words. *Citrullus lanatus*, wild radish, *Raphanus raphanistrum*

The objective of this study was to determine the effectiveness of preemergence herbicides between watermelon [*Citrullus lanatus* (Thunb.) Matsum. and Nak.] rows for weed control in rye (*Secale cereale* L.) cover crops between rows. Preemergence herbicides tank mixed with paraquat were fomesafen at 0.23 and 0.72 kg/ha, flumioxazin 0.07 and 0.14 kg/ha, *S*-metolachlor at 0.11 and 0.17 kg/ha, and terbacil at 0.11, 0.17, and 0.43 kg/ha. At 10 and 18 d after application (DAA), a preemergence herbicide tank mixed with paraquat increased wild radish (*Raphanus raphanistrum* L.) control (0% = no control, 100% = complete control) compared to control with application of paraquat alone. *S*-metolachlor at 0.11 kg/ha provided reduced wild radish control at 10 and 18 DAA (70% and 66%, respectively) compared to all other preemergence herbicide treatments (83% to 100% and 84% to 96%, respectively). No injury from the preemergence herbicides was observed. Volunteer iron clay pea [*Vigna unguiculata* (L.) Walpers] emerged at 18 DAA and no differences in iron clay pea control were observed among treatments. The use of a 30.5-cm-wide weed-free strip beside the planting bed will allow farmers to apply posttransplant herbicide treatments later or further away from the planting bed.

Seedless watermelon [*Citrullus lanatus* (Thunb.) Matsum. and Nak.] production largely utilizes plasticulture. Many growers plant rye (*Secale cereale* L.) between the rows of polyethylene mulch to reduce plant injury from wind blown sand and minimize soil erosion (Hoyt, 1999). In watermelon production, tendrils can wrap around the rye grass to prevent wind from blowing the plant. Rye grass is killed with a nonselective herbicide application (Olson and Santos, 2011). The application is directed to the row middles after transplanting the watermelon plants. Spray drift from the herbicide application will injure the watermelon plant.

Preemergence herbicides provide a longer period of weed control (Olson and Santos, 2011). Fomesafen, flumioxazin, *S*-metolachlor, and terbacil provide preemergence weed control of many broadleaf and grass species. The objectives of this research was to determine the effect of a 30.5-cm weed-free strip beside the raised bed on control of weeds and rye cover crop.

Materials and Methods

This study was conducted at the Gwinn Brothers Farm, McAlpin, FL. After laying low density polyethylene mulch, rye grass was broadcast seeded over the field. Ryegrass was 13 cm tall and wild radish (*Raphanus raphanistrum* L.) was 5 cm tall with five true leaves at the time herbicide treatments were applied. Treatments were applied on 28 Feb. 2011 with a backpack CO_2 sprayer with an 11003 EVS nozzle calibrated to deliver 283 L/ha of spray solution. Herbicides were applied as a 38.1 to 45.1 banded treatment to the row middle of both sides of the bed. The spray solution was not sprayed higher more than 5 cm up the shoulder of the bed. 'Slice and Serve' seedless watermelon and pollinizer 'Abbott & Cobb 2800' were planted 7 DAA.

Plots were visually rated for weed control (0% = no weed control, 100% = complete weed control) at 10, 18, 25, and 31 d after application (DAA). The grower applied paraquat and halosulfuron to the row middles at 18 DAA. Watermelon injury (0% = no crop injury, 100% = plant death) was visually rated at 10 and 18 DAA. Data were analyzed with analysis of variance and means were separated with Fisher's Protected LSD ($P < 0.05$).

Results and Discussion

Application of paraquat alone and in a tank mix controlled the ryegrass at 100% at 10 and 18 DAA. At 10 DAA, wild radish had regrowth from rosettes and new plants were germinating. Tank mixing a preemergence herbicide with paraquat increased wild radish control (70% to 100%) compared to paraquat alone (43%) (Table 1). All preemergence herbicides provided similar wild radish control (83% to 100%) except *S*-metolachlor at 0.11 g/ha (70%).

At 10 and 18 DAA, paraquat alone provided 35% wild radish control, which was insufficient control. Wild radish control decreased between 10 and 18 DAA. The preemergence tank mix provided greater control than the paraquat alone treatment. Application of *S*-metolachlor at 0.11 provided reduced wild radish control (66%) compared to the other preemergence herbicide treatments (85% to 96%).

At 18 DAA, the grower applied a tank mix of paraquat and halosulfuron, which is common practice for the grower. This

†This paper was presented at the 2011 FSHS meeting in St. Petersburg, FL.
*Corresponding author; phone: (352)273-4771; email: pdittmar@ufl.edu

Table 1. Effect of preemergence herbicides on percent wild radish control[z] at 10 and 18 d after application (DAA).

		Wild radish control	
Herbicide	Rate (kg/ha)	10 DAA (%)	18 DAA (%)
Fomesafen[y]	0.23	100	96
Fomesafen	0.72	100	96
Flumioxazin	0.07	96	84
Flumioxazin	0.14	99	89
S-metolachlor	0.11	70	66
S-metolachlor	0.17	83	85
Terbacil	0.11	98	93
Terbacil	0.17	100	90
Terbacil	0.43	96	86
Paraquat	0.57	43	35
Nontreated		0	0
LSD ($P \leq 0.05$)		21	17

[z]0% = no control, 100% = complete control.

[y]Fomesafen, flumioxazin, *S*-metolachlor, and terbacil were tank mixed with paraquat at 0.57 g/ha.

treatment controlled the wild radish in the plots with herbicide treatments. The grower's herbicide treatment did not remove the large wild radish plants (38 to 46 cm tall) that were in the nontreated plots and required a work crew to hand remove the wild radish to prevent interference during the harvest. After 18 DAA, volunteer iron clay pea started to emerge. No differences in control of iron clay pea were observed among treatments.

Preplant herbicide treatments did not result in watermelon crop injury. The grower's posttransplant herbicide did result in chlorosis of the new growth and necrotic spots on the older leaves. Greater injury was observed in the study's nontreated plots where the ryegrass and wild radish were taller. To control the taller plants, the spray nozzle may have been raised or more solution had been sprayed over the top.

The use of a 30.5-cm weed-free area in the row middles of watermelon has many advantages for a ryegrass row middle system. The weed-free area allows a delay in the postransplant application because the spray nozzles will be further from the watermelon plants. Data from this experiment can be used to expand use of cover crops in the row middles and developing an integrated weed control system.

Literature Cited

Hoyt, G.D. 1999. Tillage and cover residue affects on vegetable yields. HortTechnology 9:351–358.

Olson, S.M. and B. Santos (eds.). 2011. Vegetable production handbook for Florida 2011–2012. Vance Publishing, Lincolnshire, IL.