

Economics of Commercial Weed Control Programs in No-Till Soybean, 2008 Christy L. Sprague

A field trial in no-till soybean was conducted in 2008 at the MSU Research Farm in E. Lansing to compare weed control, soybean injury, soybean yield, and economic returns of dominant weed control programs being marketed to Michigan growers. Each major herbicide company was asked to submit up to four weed control programs for the studies based on soil type and weed infestation history. Site characteristics and herbicide application timings are described in Table 1. Table 2 describes the herbicide programs selected by each company for 2008. Herbicide programs are sorted by application timing and the need for Roundup Ready seed. The maximum soybean yield was 45.8 bu/A and the weedy (untreated) yield was 15.8 bu/A, resulting in a yield loss of 30 bu/A (66%). Table 3 contains the data for weed control, herbicide program costs, soybean yield, and economic returns.

Table 1. Site description.

Crop	Soybean
Variety	Asgrow 2107
Soil Texture	Sandy loam
Soil pH	6.3
Soil Organic Matter	2.6
Dominant Weeds	c. chickweed, dandelion, horseweed (marestail), perennial sowthistle, annual grasses (foxtail and crabgrass) and c. lambsquarters
Planting Date	May 13
Application Timings:	
14 d EPP	April 28
7 d EPP	May 5
PRE	May 13
Early-POST (EPOS)	June 12
Mid-POST (MPOS)	June 18
POST	June 23
Late-POST (LPOS)	July 8

Table 2. Commercial no-till soybean herbicide programs selected by companies.

Roundup Ready	Treatments (Rate/A)	Abbreviated Form
14EPP/LPOS	Canopy (2.25 oz) + 2,4-D ester (1 pt) + COC(1%) fb. Roundup PMax (22 fl oz) + AMS (17 lb/100 gal)	Canopy + 2,4-D fb. RupPM
	Envive (2.5 oz) + 2,4-D ester (1 pt) + COC (1%) fb. Roundup PowerMax (22 fl oz) + AMS (2.5 lb)	Envive + 2,4-D fb. RupPM
14EPP/MP/LP	Roundup PowerMax (22 fl oz) + 2,4-D ester (1 pt) + AMS (17 lb/100 gal) fb. Roundup PowerMax (32 fl oz) + AMS (17 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal)	RupPM + 2,4-D fb. RPM fb. RPM
7EPP/POST	Roundup PowerMax (22 fl oz) + 2,4-D ester (1 pt) + AMS (17 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal) Boundary (1.5 pt) + Gramoxone (2.5 pt) + 2,4-D ester (1 pt) + COC (1%) fb. Touchdown Total (24 fl oz) + AMS (17 lb/100 gal) Prefix (2 pt) + Gramoxone (2.5 pt) + 2,4-D ester (1 pt) + COC (1%) fb. Touchdown Total (24 fl oz) + AMS (17 lb/100 gal)	RupPM + 2,4-D fb. RPM Boundary + Gram + 2,4-D fb. Tdown Prefix + Gram + 2,4-D fb. Tdown
7EPP/LPOS	Extreme (3 pt) + 2,4-D ester (1 pt) + NIS (0.25%) + AMS (17 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal) Prowl H ₂ O (2.6 pt) + Roundup PowerMax (22 fl oz) + 2,4-D ester (1 pt) + AMS (17 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal) Authority First (3.2 oz) + Rage D-Tech (0.75 pt) + Roundup PowerMax (16 fl oz) + AMS (17 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal) Authority MTZ (12 oz) + Rage D-Tech (0.75 pt) + Roundup PowerMax (16 fl oz) + AMS (17 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal) Authority Assist (5 fl oz) + Rage D-Tech (0.75 pt) + Roundup PowerMax (16 fl oz) + AMS (17 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal) Valor (2 oz) + Roundup PowerMax (22 fl oz) + 2,4-D ester (1 pt) + AMS (17 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal)	Extreme + 2,4-D fb. RupPM Prowl + RupPM + 2,4-D fb. RupPM Auth1st + RageD + RPM fb. RPM AuthMTZ + RageD + RPM fb. RPM AuthAsst + RageD + RPM fb. RPM Valor + RPM + 2,4-D fb. RPM
7EPP/EP/LP	Gramoxone (2.5 pt) + 2,4-D ester (1 pt) + COC (1%) fb. Sequence (3.5 pt) + AMS (17 lb/100 gal) fb. Touchdown Total (24 fl oz) + AMS (17 lb/100 gal)	Gram + 2,4-D fb. Seq fb. Tdown
7EPP/MP/LP	Gramoxone (2.5 pt) + 2,4-D ester (1 pt) + COC (1%) fb. Touchdown Total (24 fl oz) + AMS (17 lb/100 gal) fb. Touchdown Total (24 fl oz) + AMS (17 lb/100 gal)	Gram + 2,4-D fb. Tdown fb. Tdown
PRE/POST	Valor XLT (3 oz) + Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal) IntRRo (1.5 qt) + Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS (17 lb/100 gal)	Valor XLT + RupPM fb. RupPM IntRRo + RupPM fb. RupPM
PRE/MP/LP	Roundup PMax (22 fl oz) + AMS (17 lb/100 gal) fb. Roundup PMax (22 fl oz) + AMS (17 lb/100 gal) fb. Roundup PMax (22 fl oz) + AMS (17 lb/100 gal)	RupPM fb. RPM fb. RPM
PRE/POST/LP	Valor (2 oz) + Roundup PMax (22 fl oz) + AMS (17 lb/100 gal) fb. Roundup PMax (22 fl oz) + AMS (17 lb/100 gal) fb. Roundup PMax (22 fl oz) + AMS (17 lb/100 gal)	Valor + RupPM fb. RPM fb. RPM

Table 3. Soybean injury, weed control, program costs, soybean yield, and economic returns for 18 no-till herbicide programs in 2008.

Application Timing	Herbicide Program	All weeds controlled ¹	Weed control costs ²	Yield	Economic Returns ³
		— ≥95% —	— \$/A —	— bu/A —	— dollars (\$) /A —
14 EPP/LPOS	Canopy + 2,4-D fb. RupPM	YES	\$49.65	41.9*	\$285.55*
	Envive + 2,4-D fb. RupPM	YES	\$51.38	40.1*	\$269.42*
14 EPP/MP/LP	RupPM + 2,4-D fb. RPM fb. RPM	YES	\$72.97	42.7*	\$268.63*
7 EPP/POST	RupPM + 2,4-D fb. RPM	YES	\$54.23	37.6	\$246.57
	Boundary + Gram + 2,4-D fb. Tdown	YES	\$65.62	38.8	\$244.78
	Prefix + Gram + 2,4-D fb. Tdown	YES	\$63.08	41.6*	\$269.72*
7 EPP/LPOS	Extreme + 2,4-D fb. RupPM	YES	\$57.88	39.5*	\$258.12*
	Prowl + RupPM + 2,4-D fb. RupPM	YES	\$64.13	37.2	\$233.47
	Auth1st + RageD + RPM fb. RPM	YES	\$65.09	37.9	\$238.11
	AuthMTZ + RageD + RPM fb. RPM	YES	\$64.97	40.4*	\$258.23*
	AuthAsst + RageD + RPM fb. RPM	YES	\$64.89	35.6	\$219.91
7 EPP/EP/LP	Valor + RPM + 2,4-D fb. RPM	YES	\$62.93	45.6*	\$301.87*
	Gram + 2,4-D fb. Seq fb. Tdown	YES	\$80.63	40.2*	\$240.97
7 EPP/MP/LP	Gram + 2,4-D fb. Tdown fb. Tdown	YES	\$71.78	38.7	\$237.82
PRE/POST	Valor XLT + RupPM fb. RupPM	YES	\$61.65	45.8*	\$304.75*
	IntRRo + RupPM fb. RupPM	YES	\$60.84	43.9*	\$290.36*
PRE/MP/LP	RupPM fb. RPM fb. RPM	YES	\$73.78	43.7*	\$275.82*
PRE/POST/LP	Valor + RupPM fb. RPM fb. RPM	YES	\$79.67	43.7*	\$269.93*
	Untreated	NO	—	15.8	\$126.40

Abbreviations: fb. = followed by.

¹Weeds = c. chickweed, dandelion, horseweed (marestail), perennial sowthistle, annual grasses (foxtail and crabgrass) and c. lambsquarters

²Herbicide and additive costs = avg. of price lists (April 2008); Application cost = \$6.00/A; Roundup Ready seed premium = \$14.75/A; seeding rate = 210,000 seeds/A. Weed control costs = Herbicide \$ + Additive \$ + Application \$ + seed premium \$ (where applicable).

³Crop selling price = \$8.00/bu (December 2008). Economic return = (Yield x Price) – Weed Control Costs.

* Values are not significantly different from the highest value within that column.