

Economics of Commercial Weed Control Programs in No-Till Soybean, 2010 Christy L. Sprague

A field trial in no-till soybean was conducted in 2010 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 2010. Herbicide programs are sorted by application timing. The maximum soybean yield was 47.8 bu/A and the weedy (untreated) yield was 22.4 bu/A, resulting in a yield loss of 25.4 bu/A (53%). Table 3 contains the data for weed control, herbicide program costs, soybean yield, and economic returns. Please note overall yields were lower than previous years due to minimal rainfall at this location during July and August (pod-fill). In fact, many herbicide programs regardless of program cost were amongst the highest economic return, since there were very little differences in yield between treatments.

Table 1. Site description.

Crop	Soybean
Variety	Asgrow 2108
Soil Texture	Clay loam
Soil pH	6.5
Soil Organic Matter	2.9
Dominant Weeds	c. chickweed, dandelion, horseweed, annual grasses (foxtail and crabgrass), and c. ragweed
Planting Date	May 25
Application Timings:	
14 d EPP	April 26
7 d EPP	May 3
PRE	May 25
POST	June 25

Abbreviations: 14 d EPP & 7 d EPP = treatments were meant to be applied 14 and 7 days prior to planting, respectively; PRE = preemergence.

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

<i>Timing</i>	<i>Treatments (Rate/A)</i>	<i>Abbreviated Form</i>	
14 EPP/POST	Canopy (2.25 oz) + 2,4-D ester (1 pt) + COC (1%) fb. Roundup PowerMax (22 fl oz) + AMS ¹	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	Envive + 2,4-D fb. RupPM	
7 EPP/POST	Valor (2 oz) + Roundup PowerMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Roundup PowerMax (22 fl oz) + AMS	Valor + RupPM + 2,4-D fb. RupPM	
	Valor XLT (3 oz) + Roundup PowerMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Roundup PowerMax (22 fl oz) + AMS	Valor XLT + RupPM + 2,4-D fb. RupPM	
	Valor (2 oz) + Roundup PowerMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Roundup PowerMax (22 fl oz) + Warrant (3 pt) + AMS	Valor + RupPM + 2,4-D fb. RupPM + Warrant	
	Extreme (3 pt) + 2,4-D ester (1 pt) + NIS (0.25%) + AMS fb. Roundup PowerMax (22 fl oz) + AMS	Extreme + 2,4-D fb. RupPM	
	Roundup PowerMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Roundup PowerMax (22 fl oz) + Warrant (3 pt) + AMS	RupPM + 2,4-D fb. RupPM + Warrant	
	Gramoxone Inteon (2.5 pt) + 2,4-D ester (1 pt) + COC (1%) fb. Touchdown Total (24 fl oz) + AMS (8.5 lb/100 gal)	Gram + 2,4-D fb. Tdown	
	Prefix (2 pt) + Gramoxone Inteon (3 pt) + 2,4-D ester (1 pt) + COC (1%) fb. Touchdown Total (24 fl oz) + AMS (8.5 lb/100 gal)	Prefix + Gram + 2,4-D fb. Tdown	
	Gramoxone Inteon (3 pt) + 2,4-D ester (1 pt) + COC (1%) fb. Sequence (3.5 pt) + AMS (8.5 lb/100 gal)	Gram + 2,4-D fb. Sequence	
	Ignite (36 fl oz) + AMS (8.5 lb/100 gal) fb. Roundup PowerMax (22 fl oz) + AMS	Ignite (H) fb. RupPM	
	Ignite (22 fl oz) + 2,4-D ester (1 pt) + AMS (8.5 lb/100 gal) fb. Roundup PMax (22 fl oz) + AMS	Ignite (L) + 2,4-D fb. RupPM	
	Ignite (22 fl oz) + Sharpen (1 fl oz) + AMS (8.5 lb/100 gal) fb. Roundup PMax (22 fl oz) + AMS	Ignite (L) + Sharpen fb. RupPM	
	Roundup PowerMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Roundup PMax (22 fl oz) + AMS	RupPM + 2,4-D fb. RupPM	
	PRE/POST	Optill (2 oz) + Roundup PowerMax (22 fl oz) + MSO (1%) + AMS fb. Roundup PMax (22 fl oz) + AMS	Optill + RupPM fb. RupPM

¹ AMS rates are 17 lb/100 gallons of spray solution unless otherwise stated.

Table 3. Soybean injury, weed control, program costs, soybean yield, and economic returns for 22 no-till herbicide programs in 2009.

Application Timing	Herbicide Program	All weeds controlled ¹	Weed control costs ²	Yield	Economic Returns ³
		— ≥90% —	— \$/A —	— bu/A —	— dollars (\$) /A —
14 EPP/MPOS	Canopy + 2,4-D fb. RupPM	YES	\$53.65	44.2*	\$487.80*
	Envive + 2,4-D fb. RupPM	YES	\$56.05	46.3*	\$511.13*
7 EPP/POST	Valor + RupPM + 2,4-D fb. RupPM	YES	\$61.40	43.8*	\$475.15*
	Valor XLT + RupPM + 2,4-D fb. RupPM	YES	\$62.40	46.2*	\$503.55*
	Valor + RupPM + 2,4-D fb. RupPM + Warrant	YES	\$70.80	44.1*	\$469.43*
	Extreme + 2,4-D fb. RupPM	YES	\$63.90	40.5*	\$432.23
	RupPM + 2,4-D fb. RupPM + Warrant	YES	\$61.25	40.7*	\$437.33
	Gram + 2,4-D fb. Tdown	YES	\$55.20	40.5*	\$440.93
	Prefix + Gram + 2,4-D fb. Tdown	YES	\$68.60	43.5*	\$464.28*
	Gram + 2,4-D fb. Sequence	YES	\$66.90	42.1*	\$448.83*
	Ignite (H) fb. RupPM	YES	\$58.40	44.2*	\$483.05*
	Ignite (L) + 2,4-D fb. RupPM	YES	\$55.05	46.8*	\$518.25*
	Ignite (L) + Sharpen fb. RupPM	YES	\$62.85	47.1*	\$514.13*
	RupPM + 2,4-D fb. RupPM	NO	\$51.90	47.8**	\$533.65**
PRE/POST	Optill + RupPM fb. RupPM	YES	\$63.10	45.7*	\$496.73*
	<i>Untreated</i>	NO	—	22.4	\$274.40

Abbreviations: fb. = followed by.

¹Weeds = c. chickweed, dandelion, horseweed, annual grasses (foxtail and crabgrass), and c. ragweed

²Herbicide and additive costs = avg. of price lists (April 2010); Application cost = \$7.00/A; Roundup Ready seed premium = \$21.73/A; seeding rate = 200,000 seeds/A. Weed control costs = Herbicide \$ + Additive \$ + Application \$ + seed premium \$ (where applicable).

³Crop selling price = \$12.25/bu (December 2010). Economic return = (Yield x Price) – Weed Control Costs.

* Values are not significantly different from the highest value within that column. **Highest yielding and highest economic returns.