

## Economics of Commercial Weed Control Programs in No-Till Soybean, 2009

Christy L. Sprague

A field trial in no-till soybean was conducted in 2009 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 2009. Herbicide programs are sorted by application timing and the need for Roundup Ready seed. The maximum soybean yield was 73.6 bu/A and the weedy (untreated) yield was 32.8 bu/A, resulting in a yield loss of 40.8 bu/A (55%). Table 3 contains the data for weed control, herbicide program costs, soybean yield, and economic returns.

*Table 1.* Site description.

<b>Crop</b>	Soybean
<b>Variety</b>	Asgrow 2107
<b>Soil Texture</b>	Sandy loam
<b>Soil pH</b>	6.3
<b>Soil Organic Matter</b>	2.6
<b>Dominant Weeds</b>	c. chickweed, dandelion, hairy fleabane, annual grasses (foxtail and crabgrass), c. ragweed, and c. lambsquarters
<b>Planting Date</b>	May 20
<b>Application Timings:</b>	
<b>7 d EPP</b>	May 8
<b>Mid-POST (MPOS)</b>	June 23
<b>POST</b>	June 25

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

<i>Conventional</i>	<i>Treatments (Rate/A)</i>	<i>Abbreviated Form</i>
<b>7EPP/MPOS</b>	Envive (3.5 oz) + Prowl H <sub>2</sub> O + 2,4-D ester (1 pt) + COC (1%) fb. Flexstar (1 pt) + Assure II (8 fl oz) + COC (1%)	Envive + Prowl fb. Flex + Assure
	Prowl H <sub>2</sub> O (2 pt) + Extreme (3 pt) + 2,4-D ester (1 pt) + NIS (0.25%) + AMS <sup>1</sup> fb. Flexstar (10 fl oz) + COC (1%)	Prowl + Extr + 2,4-D fb. Flexstar
	Boundary (2.5 pt) + Gramoxone (2.5 pt) + 2,4-D ester (1 pt) + COC (1%) fb. Flexstar (1 pt) + Fusion (8 fl oz) + COC (0.5%)	Bndry+Gram+2,4-D fb. Flex+Fusion
	Valor XLT (3.5 oz) + Prowl H <sub>2</sub> O (2 pt) + 2,4-D ester (1 pt) + NIS (0.25%) fb. Cobra (8 fl oz) + SelectMax (10 fl oz) + NIS (0.25%) + AMS (2.5 lb)	ValXLT+Prowl+2,4-D fb.Cobra+SMax
	Ignite (22 fl oz) + Prowl H <sub>2</sub> O (2 pt) + AMS fb. Flexstar (1 pt) + Select (6 fl oz) + COC (1%)	Ignite + Prowl fb. Flexstar + Select
	Ignite (22 fl oz) + Valor (2.5 oz) + AMS fb. Flexstar (1 pt) + Select (6 fl oz) + COC (1%)	Ignite + Valor fb. Flexstar + Select
	<b>Roundup Ready</b>	
<b>7EPP/POST</b>	Envive (2.5 oz) + 2,4-D ester (1 pt) + COC (1%) fb. Roundup PMax (22 fl oz) + AMS	Envive + 2,4-D fb. RPM
	Flexstar GT (3 pt) + 2,4-D (1 pt) + COC (1%) + AMS fb. Touchdown Total (24 fl oz) + AMS	FlexGT + 2,4-D fb. Tdown
	Extreme (3 pt) + 2,4-D (1 pt) + NIS (0.25%) + AMS fb. Roundup PMax (22 fl oz) + AMS	Extreme + 2,4-D fb. RPM
	Python (0.8 oz) + Durango DMA (24 fl oz) + 2,4-D ester (1 pt) + AMS fb. Durango DMA (24 fl oz) + AMS	Python + Dura + 2,4-D fb. Dura
	Sonic (3 oz) + Durango DMA (24 fl oz) + 2,4-D ester (1 pt) + AMS fb. Durango DMA (24 fl oz) + AMS	Sonic + Dura + 2,4-D fb. Dura
	Prowl H <sub>2</sub> O (2 pt) + Roundup PMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Roundup PMax (22 fl oz) + AMS	Prowl + RPM + 2,4-D fb. RPM
	IntRRo (2 qt) + Roundup PMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Rdup PMax (22 fl oz) + AMS	IntRRo + RPM + 2,4-D fb. RPM
	Valor (2 oz) + Roundup PMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Roundup PMax (22 fl oz) + AMS	Valor + RPM + 2,4-D fb. RPM
	Valor XLT (3 oz) + Roundup PMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Roundup PowerMax (22 fl oz) + AMS	Valor XLT + RPM + 2,4-D fb. RPM
	Gangster (2.4 oz) + Roundup PMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Roundup PowerMax (22 fl oz) + AMS	Gangster + RPM + 2,4-D fb. RPM
	Boundary (2.5 pt) + Gramoxone (2.5 pt) + 2,4-D ester (1 pt) + COC (1%) fb. Flexstar GT (3 pt) + NIS (0.25%) + AMS	Bndry+Gram+2,4-D fb. FlexstarGT
	Prefix (2 pt) + Gramoxone (2.5 pt) + 2,4-D ester (1 pt) + COC (1%) fb. Touchdown (24 fl oz) + AMS	Prefix+Gram+2,4-D fb. Tdown
	Roundup PMax (22 fl oz) + 2,4-D ester (1 pt) + AMS fb. Roundup PMax (22 fl oz) + AMS	RPM + 2,4-D fb. RPM
	Ignite (22 fl oz) + AMS fb. Roundup PMax (22 fl oz) + AMS	Ignite (L) fb. RPM
	Ignite (36 fl oz) + AMS fb. Roundup PMax (22 fl oz) + AMS	Ignite (H) fb. RPM
	Canopy (2.25 oz) + 2,4-D ester + COC (1%) fb. Roundup PMax (22 fl oz) + AMS	Canopy + 2,4-D fb. RPM

<sup>1</sup> 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.

<b>Application Timing</b>	<b>Herbicide Program</b>	<b>All weeds controlled<sup>1</sup></b>	<b>Weed control costs<sup>2</sup></b>	<b>Yield</b>	<b>Economic Returns<sup>3</sup></b>
		— $\geq$ 90% —	— \$/A —	— bu/A —	— dollars (\$) /A —
<i>Conventional</i>					
<b>7EPP/MPOS</b>	Envive + Prowl + 2,4-D fb. Flex + Assure	<b>YES</b>	\$66.56	<b>67.5*</b>	<b>\$591.57*</b>
	Prowl + Extr + 2,4-D fb. Flexstar	<b>YES</b>	\$56.45	<b>68.2*</b>	<b>\$608.50*</b>
	Bndry+Gram+2,4-D fb. Flex+Fusion	NO	\$81.24	<b>64.0*</b>	<b>\$542.76*</b>
	ValXLT+Prwl+2,4-D fb. Cob+SMax	NO	\$61.46	<b>65.8*</b>	<b>\$580.09*</b>
	Ignite + Prowl fb. Flexstar + Select	NO	\$61.80	61.0	\$532.95
	Ignite + Valor fb. Flexstar + Select	NO	\$64.17	61.0	\$530.58
<i>Roundup Ready</i>					
<b>7EPP/POST</b>	Envive + 2,4-D fb. RPM	<b>YES</b>	\$62.51	<b>69.2*</b>	<b>\$612.19*</b>
	FlexGT + 2,4-D fb. Tdown	<b>YES</b>	\$74.01	<b>69.2*</b>	<b>\$600.69*</b>
	Extreme + 2,4-D fb. RPM	<b>YES</b>	\$70.48	<b>71.7*</b>	<b>\$628.60*</b>
	Python + Dura + 2,4-D fb. Dura	<b>YES</b>	\$72.23	<b>73.6**</b>	<b>\$645.37**</b>
	Sonic + Dura + 2,4-D fb. Dura	<b>YES</b>	\$75.84	<b>68.2*</b>	<b>\$589.11*</b>
	Prowl + RPM + 2,4-D fb. RPM	<b>YES</b>	\$74.39	<b>68.0*</b>	<b>\$588.61*</b>
	IntRRo + RPM + 2,4-D fb. RPM	<b>YES</b>	\$77.14	<b>70.7*</b>	<b>\$612.19*</b>
	Valor + RPM + 2,4-D fb. RPM	<b>YES</b>	\$74.42	<b>66.7*</b>	<b>\$575.91*</b>
	Valor XLT + RPM + 2,4-D fb. RPM	<b>YES</b>	\$75.52	<b>68.9*</b>	<b>\$596.26*</b>
	Gangster + RPM + 2,4-D fb. RPM	<b>YES</b>	\$84.31	<b>70.0*</b>	<b>\$598.19*</b>
	Bndry+Gram+2,4-D fb. FlexstarGT	<b>YES</b>	\$96.23	<b>68.2*</b>	<b>\$568.72*</b>
	Prefix+Gram+2,4-D fb. Tdown	<b>YES</b>	\$76.41	<b>68.9*</b>	<b>\$595.37*</b>
	RPM + 2,4-D fb. RPM	<b>YES</b>	\$65.07	<b>67.4*</b>	<b>\$592.08*</b>
	Ignite (L) fb. RPM	NO	\$60.96	<b>67.5*</b>	<b>\$597.17*</b>
	Ignite (H) fb. RPM	NO	\$67.88	<b>64.8*</b>	<b>\$563.92*</b>
	Canopy + 2,4-D fb. RPM	<b>YES</b>	\$60.39	<b>66.7*</b>	<b>\$589.94*</b>
	<b>Untreated</b>	NO	—	32.8	—

Abbreviations: fb. = followed by.

<sup>1</sup>Weeds = c. chickweed, dandelion, hairy fleabane, annual grasses (foxtail and crabgrass), c. ragweed, and c. lambsquarters

<sup>2</sup>Herbicide and additive costs = avg. of price lists (April 2009); Application cost = \$7.00/A; Roundup Ready seed premium = \$15.00/A; seeding rate = 210,000 seeds/A. Weed control costs = Herbicide \$ + Additive \$ + Application \$ + seed premium \$ (where applicable).

<sup>3</sup>Crop selling price = \$9.75/bu (December 2009). 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.