

## Evaluation of Herbicides For Weed Control and Crop Injury in Snap Beans: 2004

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### Final Report

**Objective:** To evaluate and compare selected herbicide treatments for control of yellow top and potential phytotoxicity on snap beans (*Phaseolus vulgaris*) grown in the Pearsall, Texas region.

**Materials and Methods:** The trial was conducted on the farm of Gary Boyd located in Derby, TX on a sandy loam soil. The trial site was prepared according to standard grower practices by applying a pre-plant fertilizer, then disking the field and planting beans in 5-row beds. Snap beans (var. “BBL 156”) were planted on February 28, and plots measuring 6.67’ x 20’ were replicated throughout the field. Herbicides were applied using a CO<sub>2</sub>-backpack sprayer equipped with a hand-held boom containing four Teejet 8002VS nozzles that sprayed at a rate of 20 GPA at 30 PSI. Application data can be found in Tables 1 and 2 below for the preemergence (PRE) and postemergence (POST) treatments, respectively. The field containing the plots was irrigated as needed by a center pivot system, and all other yield-enhancing production practices performed according to grower needs. The experimental design was a randomized complete block with 3 replications. All data were subjected to ANOVA and means were separated using the Least Significant Difference ( $\alpha = 0.05$ ).

Table 1. Application Data for Preemergence Herbicides

Location	Derby, TX	Wind speed / direction	5 mph / NW
Date	Mar. 1, 2003	Crop	Snap Beans
Time of day	12:30 p.m.	Variety	“BBL 156”
Type of application	Broadcast	Crop stage	Seed
Carrier	Water	Air temp. (°F)	76
Gas (if not CO <sub>2</sub> )	CO <sub>2</sub>	Soil temp. (°F)	68
GPA	20	Soil beneath	Moist
PSI	30	Soil surface	Semi-Moist
Nozzle tips	8002	% Relative humidity	High
Nozzle spacing	18”	Sky conditions	Overcast/Partly cloudy
Boom width ( “ )	6.5’	# Replications	3
Boom height ( “ )	18”	Sprayed by	RWW
Weeds present: None			

Table 2. Application Data for Postemergence Treatments

Location	Derby, TX	Wind speed / direction	5 – 10 mph / NE
Date	Mar. 18, 2003	Crop	Snap Beans
Time of day	2:30 p.m.	Variety	“BBL 156”
Type of application	Broadcast	Crop stage	1 – 2 trifoliates
Carrier	Water	Air temp. (°F)	84
Gas (if not CO <sub>2</sub> )	CO <sub>2</sub>	Soil temp. (°F)	75
GPA	20	Soil beneath	Moist
PSI	30	Soil surface	Dry
Nozzle tips	8002	% Relative humidity	High
Nozzle spacing	18”	Sky conditions	Overcast
Boom width ( “ )	6.5’	# Replications	3
Boom height ( “ )	18”	Sprayed by	RWW
Weeds present: Redroot Pigweed (2 leaves); Morningglory (2”)			

**Results:** Crop ratings (injury/stunting) recorded on April 14 showed that only those treatments where Matrix 75DF was applied had significantly higher stunting (greater than 50%) and moderate leaf chlorosis compared to all other herbicide treatments (see Table 3). This injury would not be considered commercially acceptable. Where Sandea 75WDG and Dual Magnum 7.62E were applied PRE there was 10% stunting with no chlorosis, and this was considered to be commercially acceptable. However, by harvest (May 6) crop injury in the Matrix treatments was greatly reduced (15% or less).

Unfortunately, there was no yellow top (Golden Crown Beard) found within the test site. However, there was low to moderate populations of Redroot Pigweed in the area. Control of redroot pigweed was generally excellent for all treatments (Table 3) recorded on April 14, and this trend continued until harvest (May 6) except where Matrix was applied alone. In that treatment, control dropped to 70% by harvest.

Snap bean yields were not significantly influenced by weed pressure, as indicated by the relatively good yields in the untreated plots. However, significantly reduced yields were found for plots treated PRE with Matrix or POST Sandea (0.67 oz/A) plus Basagran 4L (1 pint/A) applications (see Table 3). Matrix reduced yields an average 30% compared to the highest-yielding treatment (Sandea applied 0.5 oz/A POST) or 23% compared to the untreated check. While the POST-applied Sandea plus Basagran combination had reduced yields when applied alone, it did not reduce yields when combined with PRE-applied Treflan 4HFP or Dual Magnum. This indicates that the yield reduction in that treatment was likely the function of field variation and not herbicide treatment. All other treatments that compared selected combinations of Dual Magnum, Treflan, Sandea or Eptam 7E did not result in significantly lower yields. However, it was interesting to note that the average of both rates of Sandea applied PRE was 15% lower than the average of Sandea applied POST. This suggests good crop safety with POST-applied Sandea for this particular variety of snap beans.

**Conclusions:** With the exception of Matrix, all herbicides and their combinations performed well in this 2004 study. More research is needed with these and other herbicides to determine their effects on yellow top. Plants of yellow top have been collected from the test site and are being grown out for seed production and future greenhouse herbicide screening trials. Sandea may be good candidate as it is in the same chemical family as Matrix and is currently labeled on snap beans. More research is needed to evaluate Sandea performance on other snap bean varieties, as well as Matrix in other snap bean growing regions.

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**Table 3. The Effects of Herbicide Treatments on Crop Injury, Redroot Pigweed Control and Yield of Snap Beans**

Treatment	Rate /A	Timing	% Crop Injury 4/14	% Control Red Root Pigweed 4/14	% Crop Injury on 5/6	% Control Red Root Pigweed 5/6	No. Plants per 10 feet of row	Yield (Tons/A)
<i>Untreated</i>			0	0	0	0	30.3	10.7
<i>Treflan 4HFP + Dual Magnum 7.62E</i>	1.0 pint 1.0 pint	PPI PRE	1.7	99.0	0	99.0	28.7	9.8
<i>Treflan 4HFP + Dual Magnum 7.62E + Sandea 75WDG + NIS</i>	1.0 pint 1.0 pint 0.67 oz 0.25% v/v	PPI PRE POST POST	3.3	99.0	0	99.0	33.3	11.3
<i>Treflan 4HFP + Sandea 75WDG</i>	1.0 pint 0.5 oz	PPI PRE	3.3	99.0	0	99.0	34.7	10.4
<i>Dual Magnum 7.62E + Sandea 75WDG</i>	1.0 pint 1.0 oz.	PRE PRE	10.0	99.0	0	99.0	34.0	11.4
<i>Dual Magnum 7.62E + Sandea 75WDG + Basagran 4L + NIS</i>	3.5 pints 0.67 oz 1 pint 0.25% v/v	PPI POST POST POST	0	99.0	0	99.0	30.0	10.0
<i>Sandea 75WDG + Basagran 4L + NIS</i>	0.67 oz 1 pint 0.25% v/v	POST POST POST	0	97.7	0	96.3	30.3	9.0
<i>Treflan 4HFP + Eptam 7E</i>	1.0 pint 3.5 pints	PPI Lay-By	0	99.0	0	97.7	30.3	10.0
<i>Matrix 25DF</i>	1.0 oz	PRE	56.7	99.0	10.0	70.0	34.7	7.7
<i>Sandea 75WDG</i>	0.5 oz	PRE	3.3	99.0	0	99.0	26.7	9.1
<i>Sandea 75WDG</i>	1.0 oz	PRE	6.7	97.7	0	99.0	29.3	10.2
<i>Sandea 75WDG+ NIS</i>	0.5 oz. 0.25% v/v	POST POST	1.7	97.7	0	97.7	32.3	11.8
<i>Sandea 75WDG+ NIS</i>	1.0 oz 0.25% v/v	POST POST	0	99.0	0	96.0	35.3	11.0
<i>Treflan 4 HFP + Matrix 25DF</i>	1.0 pint 1.0 oz	PPI PRE	51.7	99.0	15.0	99.0	30.0	8.7
<i>Eptam 7E + Sandea 75WDG + NIS</i>	3.5 pints 0.67 oz 0.25%	POST Lay-By	0	99.0	0	99.0	27.3	9.9
<b>LSD (0.05)</b>			<b>7.5</b>	<b>1.8</b>	<b>7.5</b>	<b>3.6</b>	<b>6.9</b>	<b>2.7</b>

