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# Reducing Herbicide Rates for Narrow-Row Soybeans

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## Integrated Pest Management

### Overview

Reducing herbicide rates to take advantage of narrow-row soybeans' earlier canopy may be a viable option for growers. Using a fourth to a half the recommended rates of herbicides with narrow-row soybeans compared favorably to full rates in research evaluating weed control and yields.

### Objectives

Researchers sought to evaluate the influence of soybean row spacing on weed management systems that allow the use of reduced herbicide rates. The use of narrow rows eliminates the potential for using cultivation as a weed management option, which raises concerns about the possibility of increasing herbicide use. However, narrow rows result in the development of the soybean canopy earlier in the growing season, placing late-emerging weeds at a disadvantage. Weed management systems to take advantage of the crop's increased competitiveness were not well-defined.

### Results

Field experiments in Iowa and other North Central states during 1994 and 1995 compared recommended herbicide rates with reduced rates on weed control and yields in narrow-row soybeans. The 30 trials compared standard rates to a fourth of the standard rate, a half rate, two separate applications of a quarter rate and two separate applications of a half rate. Reduced rate treatments were based on

early applications, usually two weeks after planting for the quarter rate treatment, three weeks after planting for the half rate compared with four weeks after planting for the full rate. Weed control and yields were grouped by significantly less than, equal to or greater than the standard treatment.

Weed control suffered in 67 percent of the single quarter-rate applications, falling short of the standard rate (see Table 1). The half-rate treatments were more consistent, resulting in poorer weed control than recommended rates in only 14 percent of the experiments.

Both of the sequential quarter- and half-rate applications were very consistent, providing equivalent control to the full-rate treatment more than 80 percent of the time and better control more times than not.

The single quarter-rate treatment yielded less than the recommended rate in six of the 30 experiments (see Table 2). The other reduced rate treatments yielded either equal to or greater than those treated with the recommended rate. Reducing herbicide rates resulted in poorer weed control in some experiments, but there was little risk of yield loss from weed competition.

### Recommendations

Reducing rates of herbicides is a viable option in narrow-row soybeans. Rates of a quarter of those recommended provided inconsistent weed control when compared to the full rate. Two quarter-rate applications resulted in excellent consistency, but that practice requires two trips through the field at a time when growers are busy. The added cost of the second trip decreases the savings of reducing rates, but some



producers might find this is a desirable option.

All of the herbicides worked well when used in appropriate situations. It is important to select the correct product for the weed species found in the field and to apply the herbicides in a timely manner.

This system allows the grower the flexibility to make herbicide decisions after crop emergence. If adverse weather prevents a grower from making a timely application of the quarter rate and weeds exceed the 1-inch size, the rate can be increased as needed.

Reduced rates could be used in combination with preemergence herbicides. A preplant or preemergence application of a low-cost herbicide, such as Prowl or Treflan, could be applied to control grasses and some broadleaves. The grower could then use the reduced-rate program to manage weeds not controlled by the preemergence program.

Difficult to control species, such as woolly cupgrass, waterhemp or lambsquarters, may not be suitable for this approach. As with any new practice, growers should try this strategy on limited acres until they determine how to best use it. Total cost of the weed management program, including the potential need for a second application, should be calculated to determine the specific savings of this approach.

Table 1. Percentage of observations where a reduced rate treatment resulted in weed control significantly less than, equal to, or more than the 1.0X standard treatment. (Total of 73 treatments)

	Percent of observations where			
	0.25X	0.25XS <sup>1</sup>	0.5X	0.5XS <sup>2</sup>
<1.0X	67	7	14	1
=1.0X	33	88	82	81
>1.0X	0	5	4	18

<sup>1</sup>0.25XS consisted of two 0.25X treatments applied two weeks apart.

<sup>2</sup>0.5XS consisted of two 0.5X treatments applied one week apart.

Table 2. Number of experiments where a reduced rate treatment resulted in soybean yield significantly less than, equal to, or more than the 1.0X standard treatment. (Total of 30 experiments)

	Number of experiments where			
	0.25X	0.25XS <sup>1</sup>	0.5X	0.5XS <sup>2</sup>
<1.0X	6	0	0	0
=1.0X	22	26	28	24
>1.0X	2	4	2	6

<sup>1</sup>0.25XS consisted of two 0.25X treatments applied two weeks apart.

<sup>2</sup>0.5XS consisted of two 0.5X treatments applied one week apart.

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