Arkansas' Experience with Reduced Rate Herbicide Recommendations

F.L Baldwin, C.B. Guy and L.R. Oliver¹

HISTORY

n the late 1970s and early 1980s, soybean growers were reporting successes with post-emergence herbicide rates considerably lower than those on the manufacturer's labels. For a short period in the early 1980s popular press articles citing success stories using reduced rates, soybean oil carriers and application by controlled droplet sprayers were even more dramatic. Research conducted to verify these stories began to quickly show that species susceptibility, application timing and environmental conditions had far more effect on herbicide activity than did method of application, spray carrier and other factors. Through research by Banks and Oliver (1984), Hopkins et al. (1985,1986), Oliver (1989) and others, the University of Arkansas quickly built a data base to support reduced rate programs. The first approach in extending this information to the grower was to send the research data to the county agents and let them handle it on an oral basis. The county agents quickly refused to accept the burden of liability in this manner. From there the Extension Director was approached in 1985 with the data, and a request was made to place a set of reduced rate intensive management recommendations in a publication (Baldwin et al., 1990b). The potential pressures from industry and liability aspects were discussed. The Director confirmed the mission of the Land Grant system was to conduct and extend research for the grower and, if the scientists had confidence in the data base, the research should be made available.

RECOMMENDATIONS

The first reduced rate recommendations were published in 1985 for 1/4 and 1/2 labeled rates of bentazon, acifluorfen, sethoxydim and fluazifop. Since 1985, reduced rates of lactofen, imazaquin, chlorimuron, fomesafen and quizalofop have been added. In general, the postemergence rates break down as follows: 1 to 6 days after weed emergence

(DAE), 1/4 to 1/3 rates; 7 to 12 days DAE, 1/2 rates; and 13 + DAE, labeled rates. Reduced rates of the soil-appliedherbicides imazaquin, metribuzin and chlorimuron + metribuzin were added in 1987. Rates of the herbicides range from 1/2 to 2/3 labeled rates for a given soil type. The reduced rate recommendations are published as a separate section with specific instructions and can be obtained by requesting MP-44 from the Arkansas Cooperative Extension Service (Baldwin et al., 1990b). Since 1986, the reduced rate recommendations have also been published in a computer program (Baldwin, 1989). In the Arkansas reduced rate program, it is emphasized that no single reduced rate treatment is a weed control program. Reduced rate treatments are used in conjunction with other reduced rate or, in some cases, labeled rate treatments. The most consistent and economical Arkansas soybean weed control programs use a combination of reduced rate soil-applied treatment followed by a reduced rate of postemergence herbicide, if needed, to control escapes.

RESULTS

This program has been extremely popular with soybean growers in Arkansas as well as in other states. Current survey information indicates reduced rates are used on approximately one half of the Arkansas soybean acreage with an annual cost savings of \$7/acre or \$8 to 9 million annually. To date, there have been no law suits, and some of the companies who were most critical in 1985 are the most complimentary now. Industry concerns--"the average grower can't pull it off," "it is small plot work that can't be duplicated on large farms," and "the industry reps will get the complaints"--have largely proven to be unfounded. In addition, several new herbicide registrations reflect reduced rates compared to previous labels. From a research and Extension scientist point of view, reduced rate programs are extremely popular with growers, and they are much more challenging than using more herbicides to solve a problem. There are excellent opportunities for funding, and the programs are environmentally sound. The 1990 Missouri rate recom-

¹Baldwin and Guy are with the University of Arkansas Cooperative Extension Service, Little Rock, AR;Oliver is with the Department of Agronomy, University of Arkansas, Fayetteville, AR.

mendations for soybeans (Sims and DeFelice, 1991) have reduced rates.

FUTURE

Extensive research and demonstration programs are conducted each year to verify the existing recommendations and to expand the program (Baldwin et al., 1990a; Guy, 1990; Oliver et al., 1985). Low Input Sustainable Agriculture (LISA) funds have been a tremendous boost to the program. With LISA funds the reduced rate concept hasbeen taken from broadcast to very narrow band applications using precision cultivators (Baldwin, 1990). Soybean weed control programs with herbicide costs in the \$5 to \$10 range are easily attained in this program. Through the LISA grant, these concepts have been studied for agronomic and horticultural crops (Boyd, 1990; McCarty et al., 1990). The program is currently being expanded to include cover cropping, ridge tillage and crop rotation to allow even further reduction in herbicide inputs.

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