

EVOLUTION OF ISOXAFLUTOLE USE PATTERNS IN CORN. George S. Simkins, David J. Lamore, Kevin K. Watteyne and Mark A. Wrucke, Technical Service Representatives and Northern Technical Service Manager. Bayer CropScience, Research Triangle Park, NC 27709

The isoxazole herbicide family was discovered by Rhone-Poulenc in 1989. The development of isoxaflutole (RPA201772) for commercial use commenced in 1992. This compound has broad-spectrum activity on broadleaf and grass weeds. The absorption of this compound is through the roots, shoots and leaves. It has weed control activity when applied preplant, preemergence and postemergence.

Isoxaflutole (IFT) received its US registration for use in Field corn in 1998. Since its introduction in 1999 use has increased to over six million acres in 2002. In the introductory year (1999) problems were experienced with IFT causing crop injury on a significant number of the fields treated with this product. Of the three million acres treated with IFT 442,000 acres had some degree of corn injury. The reported reasons for crop injury included: excessive use rates, variable soils, mixing problems, inaccurate application, poor agronomic practices and adverse weather conditions. In order to mitigate the problems encountered in 1999, Rhone-Poulenc Ag Company made major changes in the product label which included: rate recommendations based on three general soil classifications, new mixing and loading instructions, improved application techniques and equipment recommendations. In addition to these changes considerable effort was made to educate growers and applicators on how to utilize IFT effectively while minimizing the potential for crop injury. Crop response resulting from IFT applications in subsequent years has declined to approximately 1% of the treated acres. Most of the problems encountered with mixing the IFT formulation in 1999 were due to the dense characteristics of its dry granule, which required adequate wetting to disperse the product in water or liquid fertilizer. To overcome this problem Rhone-Poulenc Ag Company developed a flowable formulation that readily mixes in water and liquid fertilizer, and has weed control activity similar to the dry granule formulation. In 2001 the flowable formulation was introduced to the market place.

Most isoxaflutole is applied preemergence in corn. Because of short interval between planting and corn emergence, combined with adverse weather conditions, the number of acres that may be treated preemergence often may be limited. Comparisons of IFT applied at different timings have shown that preemergence is the most effective method of using IFT in a one-pass program. Shallow incorporated isoxaflutole, especially in tank-mixes, is effective and may have the advantage under dry soil conditions, or when the carrier is liquid fertilizer. Preplant surface applied IFT treatments also provide effective burndown as well as residual weed control. Rates may have to be increased to insure adequate residual activity.

Mesotrione is a new active ingredient that exhibits a mode of action similar to that of IFT. Weed control efficacy of package-mix formulations of mesotrione, metolachlor and/or atrazine is similar to isoxaflutole, tank-mixed with atrazine. The residual activity of mesotrione combinations in some cases is inferior to that provided by IFT combinations, and lacks postemergence of most grasses.