

# **Sensitivity of Potato Selection AO96160-3 to Metribuzin**

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## **Abstract**

Metribuzin is an extensively used herbicide on potato. Some potato cultivars are sensitive to the herbicide and it is necessary to determine the reaction to metribuzin for any new cultivar released for commercial production. AO96160-3 is a russet potato selection that is slated for commercial release in 2008. Metribuzin rates of 0.0, 0.33, 0.67 and 1.00 lb of active ingredient per acre were applied post-emergence to plots planted with AO96160-3. No visual plant symptoms were observed. Total yields were adversely impacted by increasing rates of metribuzin. U.S. No. 1 yields followed the same trend. Herbicides other than metribuzin should be considered for weed control in AO96160-3 fields.

## **Introduction**

Metribuzin, the active ingredient in Sencor<sup>®</sup> (Bayer CropScience) and Lexone<sup>®</sup> (DuPont), is an extensively used herbicide on potatoes in Oregon. It is effective on a wide array of weeds, including broadleaves and grasses. Metribuzin is generally applied after potatoes emerge but while weeds are small. It is often used in a tank mix with other herbicides.

Metribuzin is absorbed by both roots and leaves, but moves throughout the plant only when absorbed by roots. Once in the plant, it interrupts carbohydrate synthesis by inhibiting photosynthesis. A yellowing of the interveinal areas of the leaves is generally the first visual symptom to appear. The chlorosis progresses until entire leaves are affected and plant death occurs. (Callihan and Eberlein 1991, Colquhoun 2001)

Some potato cultivars are sensitive to metribuzin, especially red- and white-skinned types. Most russeted cultivars are tolerant of the herbicide, but there are exceptions. Because of the wide range of cultivar responses to metribuzin, it is prudent to test potential new cultivar releases for their reaction to the herbicide. AO96160-3 is a russet potato selection that is slated for commercial release in 2008. It has been tested in TriState (Oregon, Washington, Idaho) and Regional (Oregon, Washington, Idaho, California, Colorado, Texas) variety trials for several years. It was observed in the Eastern Idaho trials that this selection may be sensitive to metribuzin. This experiment was designed to quantify the sensitivity of AO96160-3 to metribuzin.

## **Materials and Methods**

An experiment to evaluate the sensitivity of the advanced potato breeding selection AO96160-3 to metribuzin was planted at the Powell Butte site of Central Oregon

Agricultural Research Center on May 22, 2007. Soil type at the site is Deschutes sandy loam. The plots were arranged in a Latin square design with four treatments and four replications. Individual plots were 10.5 ft long by 9 ft wide (three rows) and were bordered on each end with a 4.5-ft unplanted area. Each of the three rows in the plots contained 14 seed pieces, spaced 9 inches apart. Fertilizer was banded at planting at a rate of 1,042 lb/acre of 16 (nitrogen [N]), 16 (phosphate [P<sub>2</sub>O<sub>5</sub>]), 16 (potash [K<sub>2</sub>O]) and 7 (sulfur [S]). The experiment was cultivated, sprinkler irrigated, and managed according to practices commonly used in central Oregon.

Treatments included an untreated check and three metribuzin rates: 0.33, 0.67 and 1.00 lb of active ingredient per acre. The metribuzin label recommends application rates of 0.25 to 1.00 lb of active ingredient per acre. The metribuzin treatments were applied on July 20 at 50 percent row closure and immediately sprinkler irrigated with 0.5 inches of water. Applications were made using a carbon dioxide-powered backpack sprayer delivering 81 gal/acre at 25 psi with Teejet 8008 flat fan nozzles. Spreader 90 (Loveland Industries) was added to the tank solution at a rate of 16 oz/100 gal of spray solution. The untreated check treatment was hand weeded in late July to minimize the impact of weeds on that treatment. Weeds were effectively controlled by all metribuzin treatments. The plots were rated for foliar injury symptoms on July 25 and August 2.

Vines were killed with 1.5 pt per acre per application of Reglone<sup>®</sup> (Syngenta) on September 5 and September 12. The vines were rolled on September 10 between the two Reglone applications. The plots were dug with a level-bed digger on October 11 and the total production from the center row of each plot was bagged by hand. Plots were graded into four size and three grade categories.

## **Results and Discussion**

The plots were visually inspected on July 25 and August 2, 5 and 13 days, respectively, after treatment application. No interveinal chlorosis was observed on the untreated check plots or any of the metribuzin-treated plots. In addition, no differences in plant height, leaf shape, or other characteristics were observed among the plots.

Total yields were adversely impacted by increasing rates of metribuzin. Yields of U.S. No. 1 grade potatoes followed the same trend, but differences were not statistically different. No differences among the treatments were observed in undersize and cull categories. Average ounces per tuber were not affected by metribuzin rate (Table 1).

The metribuzin label cautions that lower rates should be used on coarse or sandy soils. The sandy loam soil of the experiment location could have impacted the sensitivity of AO96160-3 to metribuzin. However, even the lowest applied rate reduced total yields, although not significantly, compared to the untreated check. A similar effect would likely be observed on heavier soils, though perhaps not to this extreme. At any rate, caution should be exercised when applying metribuzin to production fields of AO96160-3.

Table 1. Effect of metribuzin rate on yield and size of AO96160-3 potatoes grown at Powell Butte, Central Oregon Agricultural Research Center, in 2007.

Treatment	Rate <sup>1</sup>	Yield (cwt/acre)				Oz/tuber
		Total	U.S. No. 1	Under 4 oz.	Culls	
Untreated check	---	477	391	51	25	7.45
Metribuzin	0.33	446	379	65	28	6.88
Metribuzin	0.67	429	330	35	51	6.55
Metribuzin	1.00	394	318	46	23	7.07
LSD (5%)		56	NS	NS	NS	NS

<sup>1</sup>lb active ingredient per acre.

### Literature Cited

Callihan, R.H., and C. Eberlein. 1991. Metribuzin for weed control in potatoes. University of Idaho Current Information Series No. 291.

Colquhoun, J. 2001. How herbicides work—uptake, translocation, and mode of action. Oregon State University Extension Service Publication EM 8785.