

WEED CONTROL AND CROP TOLERANCE WITH BRONATE® IN SPRING WHEAT AND BEYOND® IN CLEARFIELD™ SPRING WHEAT

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Introduction

Weed control is important in small grain production to reduce competition to the crop and reduce the production of weed seeds for future crops. Bronate formulations were evaluated in spring wheat. Wheat has been developed that is resistant to the imidazolinone family of chemicals (Beyond, Raptor, Pursuit), allowing Beyond herbicide to be used for weed control. The resistant wheat is marketed as Clearfield wheat. Beyond was tested in Clearfield spring wheat.

Methods

General Procedures

Two trials were conducted in the same field at the Malheur Experiment Station, one comparing Bronate rates and formulations in conventional spring wheat, the other evaluating Beyond rates with different surfactants both with and without urea ammonium nitrate (32 percent N) in Clearfield spring wheat. The soil was an Owyhee silt loam with pH 8.0 and 1.2 percent organic matter. On April 4, the wheat variety 'Alpoa' was planted in the Bronate trial area at 120 lb/acre and variety 'BZ 9M 99-1210' at 120 lb/acre was planted in the Beyond trial area. Plots for both trials were 10 ft wide by 30 ft long and replicated four times in a randomized complete block design. Herbicide treatments were applied with a CO₂-pressurized backpack sprayer delivering 20 gal/acre at 30 psi. Percent crop injury and percent weed control were evaluated throughout the growing season. Grain yield was determined on July 24 by harvesting a swath 4.16 ft wide down the center of each plot with a Winterstieger small plot combine.

Bronate Formulations

Bronate formulations evaluated included both a 4- and 5-lb/gal emulsifiable concentrate (EC). Both formulations were tested at rates of 0.5 and 0.75 lb ai/acre. Each Bronate formulation at the 0.5 lb ai/acre rate was tested in a tank-mix with Harmony Extra (0.014 lb ai/acre). Herbicide applications were made on May 11 to wheat that was 7 inches tall.

Beyond Rates and Additives

Beyond was applied at 0.024 and 0.032 lb ai/acre. Each Beyond rate was tested with a non-ionic surfactant (NIS) at 0.25 percent v/v both with and without 32 percent N at 2.5 percent v/v, and SUN-IT II surfactant at 1.0 percent v/v both with and without 32 percent N. Beyond was applied to 7-inch-tall wheat on May 11.

Results

Bronate Formulations

Thirteen days after applications were made, there was no visible injury to the crop (Table 1).

All treatments provided excellent common lambsquarters and shepherdspurse control throughout the growing season (91-98 percent). On May 24, both Bronate formulations at the 0.5 lb ai/acre rate were among the weakest in common lambsquarters control (92-93 percent). All treatments were significantly better at controlling shepherdspurse than Bronate 5 EC at the 0.5 lb ai/acre rate. By July 23, all treatments provided significantly better common lambsquarters control than Bronate 5 EC at 0.5 lb ai/acre.

Possibly due to low weed populations and an absence of crop injury by any of the herbicide treatments, there were no differences in yield between any of the treatments and the untreated check.

Beyond Rates and Additives

On May 24, Beyond at the 0.032 lb ai/acre rate with either NIS plus 32 percent N or SUN-IT II plus 32 percent N gave injury significantly greater than the check (14 and 29 percent, respectively) (Table 2).

All Beyond treatments were weak on common lambsquarters control providing only 30-58 percent control throughout the season. On May 24, Beyond at 0.032 lb ai/acre plus SUN-IT II and 32 percent N resulted in significantly better common lambsquarters control than Beyond at either 0.024 or 0.032 lb ai/acre rates plus NIS only. On July 23, Beyond at 0.024 lb ai/acre plus NIS continued to be among the weakest in common lambsquarters control with Beyond at 0.024 lb ai/acre plus SUN-IT II and Beyond at 0.032 lb ai/acre with either SUN-IT II alone, or SUN-IT II plus 32 percent N, or NIS plus 32 percent N being significantly better.

There were no differences in grain yield between any treatments including the untreated check.

Table 1. Crop Injury, weed control, and grain yield with Bronate formulations and rates, Malheur Experiment Station, Oregon State University, Ontario, OR, 2001.

*Applications were made May 11 to 7-inch wheat.

†Crop injury ratings taken on May 24.

‡Wheat harvested on July 24.

Table 2. Crop injury, weed control, and grain yield with Beyond in Clearfield wheat, Malheur Experiment Station, Oregon State University, Ontario, OR, 2001.

*Applications were made May 11 to 7-inch tall wheat.

†Crop injury ratings taken on May 24.

‡Wheat harvested on July 24.