

ROUNDUP READY ALFALFA IN THE CENTRAL SAN JOAQUIN VALLEY OF CALIFORNIA

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Abstract

Roundup Ready alfalfa will be commercialized in the next few years. Studies were established to evaluate Roundup Ready alfalfa weed management systems with conventional weed control systems and strategies during stand establishment and in established alfalfa. Since the Roundup Ready alfalfa variety used in these studies was not a commercially available variety, these studies did not compare treatments based on yield and quality parameters. Weed control efficacy, alfalfa phytotoxicity and percent composition by alfalfa and weeds were measured. The main objectives of these studies are to develop weed control systems for Roundup Ready alfalfa during stand establishment and in established, producing stands. Roundup rate and timing interactions were compared for optimal control of perennial, poisonous or other problem weeds commonly found in alfalfa operations managed for high quality forage. Post emergent weed control strategies for Roundup Ready alfalfa were compared with conventional weed management systems in seedling alfalfa. Results of the seedling year study are reported with the established study being conducted this next year.

Key words: alfalfa, weed management, Roundup Ready, Roundup, Pursuit, Raptor, Buctril, Prism, common groundsel, oats, annual bluegrass, swinecress, chickweed

Introduction

A number of different annual, perennial and poisonous weeds infest alfalfa hay grown in the San Joaquin Valley of California. The type of weed infestations in any given area is usually associated with planting time (fall, winter or spring), previous cropping history and environmental characteristics of the production area. Any of these weeds left uncontrolled can seriously reduce yields or cause a complete loss of the stand, especially in the establishment year. If a loss of stand does not occur, infestations can weaken young alfalfa seedlings, retard growth and delay the first cutting. Weeds also reduce the quality and value of alfalfa hay as many or less palatable and less nutritious than alfalfa.

Properly establishing and managing an alfalfa stand are the first steps to effectively controlling weeds. But, most often weeds still become problems and growers are required to use herbicides. Currently available herbicides can provide adequate control, but additional weed control options, including Roundup Ready alfalfa will provide additional. As the Roundup Ready system is integrated into the California production system, additional concerns will need to be directed toward weed species shift and resistance management.

Procedures

A Roundup Ready alfalfa line, fall dormancy group, was seeded during the month of September. Once germination and emergence occurred, the seedling alfalfa was divided into plots and replicated four times in a randomized complete block design. Herbicide treatments

were applied at three different timings: when alfalfa was in the unifoliate to one trifoliate leaf stage, 3 to 4 trifoliate leaf stage and 6 to 10 trifoliate leaf stage. All treatments were applied with a CO₂ sprayer with 8002 flat fan nozzles, delivering 20 gallons of spray solution per acre at 40 psi. Treatments included: Roundup Ultra Max at 1 and 2 qts/A, Raptor at 5 oz/A, Pursuit + Prism at 1.5 oz + 12 oz/A, Pursuit + Buctril at 1.5 oz + 0.75 pts/A and sequential applications of Roundup Ultra Max either following a Roundup Ultra Max treatment or a Pursuit + Prism or Buctril treatment. Pursuit + Prism was followed by itself and Buctril followed Pursuit alone.

Results

Volunteer oats, common groundsel, annual bluegrass, swinecress and chickweed were all controlled between 95 and 100 percent with the Roundup treatments at all rates alone and when followed by either Pursuit, or Pursuit + Prism when applied at both the 3 to 4 and 6 to 9 trifoliate leaf stage. When applied at the unifoliate to one trifoliate leaf stage, a followup treatment of Roundup was needed to provide 100 percent control. Pursuit + Prism, either applied once at the 3 to 4 leaf stage or a second application at the 6 to 9 leaf stage provided excellent control, but somewhat less than the Roundup treatments. Pursuit when followed by Buctril or applied tank mix did not control either annual bluegrass or volunteer oats, but provided 99 to 100 percent control of swinecress and chickweed. Raptor applied at the 3 to 4 leaf stage provided the least control of all weed species in the tests.

Evaluations of alfalfa phytotoxicity for all rates and timings of Roundup Ultra Max, Pursuit + Prism, and Raptor exhibited minimal to no injury at all dates of evaluation. Pursuit in combination with Buctril applied at the 7 to 9 trifoliate leaf stage did exhibit slight reduction of growth 21 days after treatment. Harvest data for percent composition showed 95 to 100 percent alfalfa for all Roundup and Roundup combinations. The Pursuit, Buctril treatments were 70 - 85 percent alfalfa and 15 to 30 percent weeds. The Raptor treatment in one trial was 25 percent alfalfa, and 75 percent weeds (volunteer oats), but in another 95 percent alfalfa and 5 percent weeds. The control plots in one study was 50 percent alfalfa and 50 percent weeds while the other was 5 percent alfalfa and 95 percent weeds or volunteer oats.