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Andrew W. Ezell

Ronnie Turner

Jimmie L. Yeiser

Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University

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Ezell, Andrew W.; Turner, Ronnie; and Yeiser, Jimmie L., "Use of aminocyclopyrachlor for forestry site preparation in the Southeastern U.S." (2012). *Faculty Publications*. 194.

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USE OF AMINOCYCLOPYRACHLOR FOR FORESTRY SITE PREPARATION IN THE SOUTHEASTERN U.S.

Andrew W. Ezell, Ronnie Turner, and Jimmie L. Yeiser

ABSTRACT

It is not often that new chemistry is made available for use in forestry applications. Aminocyclopyrachlor is a new active ingredient which may have usefulness as a forestry herbicide. Research using this active ingredient began in 2005 and is continuing in university projects across the South. Both hardwood control efficacy and pine tolerance have been evaluated in these trials. A total of 60 different treatments have been evaluated for use in site preparation applications in Mississippi and Texas. This herbicide is effective on a number of species including some invasive exotics. It will probably not be a stand alone treatment, but could be useful in tank mix applications.

INTRODUCTION

Chemical site preparation continues to be the largest use of herbicides in forestry applications. While the number of acres varies annually, each year, more than one million acres of southern forest land receives chemical site preparation. Due to the long term economic considerations associated with site preparation, cost-efficacy of the treatments is a primary concern. For that reason, any new herbicide which has potential for such use is thoroughly investigated. New chemistry for forestry applications is reasonably rare, and the introduction of a new herbicide creates a great deal of interest.

Aminocyclopyrachlor was first evaluated for use in forestry work in 2005. For the past six years, a number of protocols have been installed at numerous locations across the South. In each of these, treatments were evaluated for effectiveness in controlling target species. Some of the studies included an evaluation of crop tolerance on planted pines.

MATERIALS AND METHODS

Since this paper is a summary of a number of field trials, broad overviews of the materials and methods used will be presented.

HERBICIDE

Aminocyclopyrachlor is a synthetic auxin (or auxin type) herbicide. It stops the growth of plants by interfering with

hormonal balance necessary for normal shoot and root development. This interference is more intense and more protracted than molecules with a similar mode of action. The material has a very low acute mammalian toxicity with oral and dermal LD₅₀ ratings of greater than 5000 ppm. The material is readily metabolized by soil microbes and the metabolites are not biologically active. Aqueous photolysis can also be a major degradation route.

APPLICATION METHODS

Aminocyclopyrachlor has been applied in more than 70 treatments in both forestry cutover and rights-of-way settings for purposes of discussion in this paper. All treatments were applied using CO₂-powered backpack sprayers and pole extensions to simulate aerial application. Total spray volumes of both 10 gpa and 15 gpa were utilized. All treatments were replicated three times.

EVALUATION

Woody vegetation stems were recorded by species and height class prior to application and again at 12-14 months after treatment. Heights were summarized by species into cumulative heights (number of stems in a height class X height). Percent reduction in cumulative heights by species was then used to evaluate treatment efficacy.

RESULTS

For purposes of this overview, results will be presented for species or species groups which were well represented in the various studies.

Red Oaks—Control was highly variable at all rates of aminocyclopyrachlor applied alone. When mixed with Arsenal AC or Razor Pro, control was consistently greater than 75 percent. Species included southern red oak, water oak, cherrybark oak and blackjack oak. There have been reports that aminocyclopyrachlor applied alone did provide good control of northern red oak in North Carolina.

Blackgum—Aminocyclopyrachlor is very effective on blackgum. Excellent control was obtained with rates as low as 6-7 oz. of product per acre.

Andrew W. Ezell, Professor and Head, Department of Forestry, Mississippi State University, Starkville, MS 39762
Ronnie Turner, U.S. Product Development Manager, DuPont Crop Protection, Memphis, TN 38125
Jimmie L. Yeiser, Professor, College of Forestry and Agriculture, Stephen F. Austin State University, Nacogdoches, TX 75962

Red Maple—Control was variable when aminocyclopyrachlor was applied alone, but excellent control was obtained in mixes which contained a low rate of Arsenal AC.

White Oaks (including Post Oak)—Very good to excellent control of this group was obtained from application rates as low as 4-5 oz. of product per acre applied alone or in mixes with imazapyr or glyphosate.

Hickory—Using 4-5 oz. of product per acre provided 70-80 percent control of hickory. The primary species were shagbark and mockernut hickories.

Persimmon—Aminocyclopyrachlor alone at 4-5 oz of product per acre provided greater than 90 percent control of persimmon.

Sumac (winged and smooth)—Aminocyclopyrachlor applied alone will provide excellent control of these species.

Eastern Baccharis—This invasive species is very difficult to control, but 4 oz. a.i. per acre of aminocyclopyrachlor provided 95-100 percent control. Mixing the product with Escort XP also provided excellent control.

Sweetgum—Aminocyclopyrachlor applied alone does not provide good control of sweetgum. Tank mixes with imazapyr or glyphosate provide very good to excellent control.

Green ash—Aminocyclopyrachlor applied alone does not provide control of green ash.

Pine tolerance—Loblolly, slash, and longleaf pine seedlings were all planted in plots treated with aminocyclopyrachlor. The first formulation tested did result in phytotoxic symptoms (needle discoloration and twisting) on the seedlings. However, the newer formulation is being tested for crop tolerance and initial results are most promising.

SUMMARY

Aminocyclopyrachlor is a new herbicide which could be useful in forestry applications. It will not be used for herbaceous weed control or woody release, but it has good potential for use in site preparation and possibly midrotation brush control (untested).