Nursery Herbicide Trials

David South

Research Reports

- 05-02 - Flumioxazin and dimethenamid
- 05-03 - Shielded Applications of Sulfonylureas
- 06-01 - MSMA
- 06-02 - Halsulfuron methyl in oak seedbeds
- 06-03 - Shielded Applications of Sulfonylureas Part II
- 06-04 - Flumioxazin and dimethenamid Part II
- 07-01 - A spurge trial in Alabama
- 07-02 - Tolerance of young loblolly pine seedlings to MSMA
- 07-03 - Shielded Applications of Sulfonylureas Part III

2007 trials

Nutsedge Herbicides

- diclosulam- Strongarm
- trifloxysulfuron-sodium Monument
  Envoke
- sulfosulfuron - Certainty

Rock Creek - Glennville

Nutsedge Herbicides

- Strongarm - peanuts
- Monument - turf
- Envoke – cotton, sugarcane, tomato
- Certainty - turf

Supplemental Labeling

Dow AgroSciences

Dow AgroSciences LLC 9330 Zionsville Road Indianapolis, IN 46268-1054 USA

Strongarm® herbicide

EPA Reg. No. 62719-288
EPA 24(c) SLN No. TN-040004

Preemergence Broadleaf Weed Control in Cottonwood Plantings

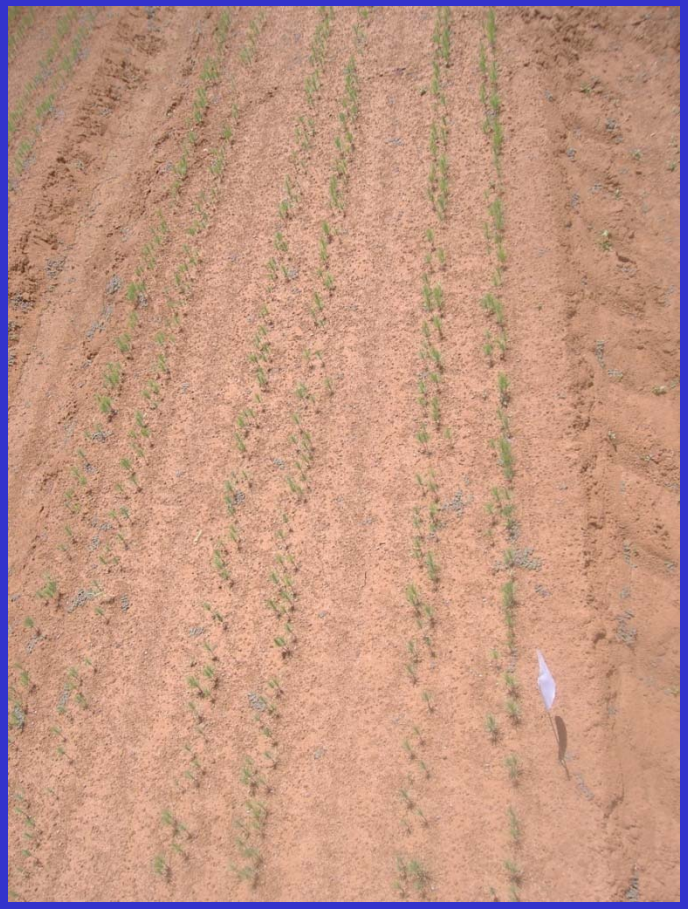
(For Distribution and Use Only in the State of Tennessee)


MONUMENT
4 g/ac
CERTAINTY
1.29 g/ac


CONTROL
STRONGARM
0.9 oz/ac
MONUMENT
8g/ac

Spurge trials

Spurge trial – applied May 10th



May 18th control plot

SureGuard *
Oust
Oryzalin **
Pendulum *

* labeled
** Do not apply to seedbeds

May 28th

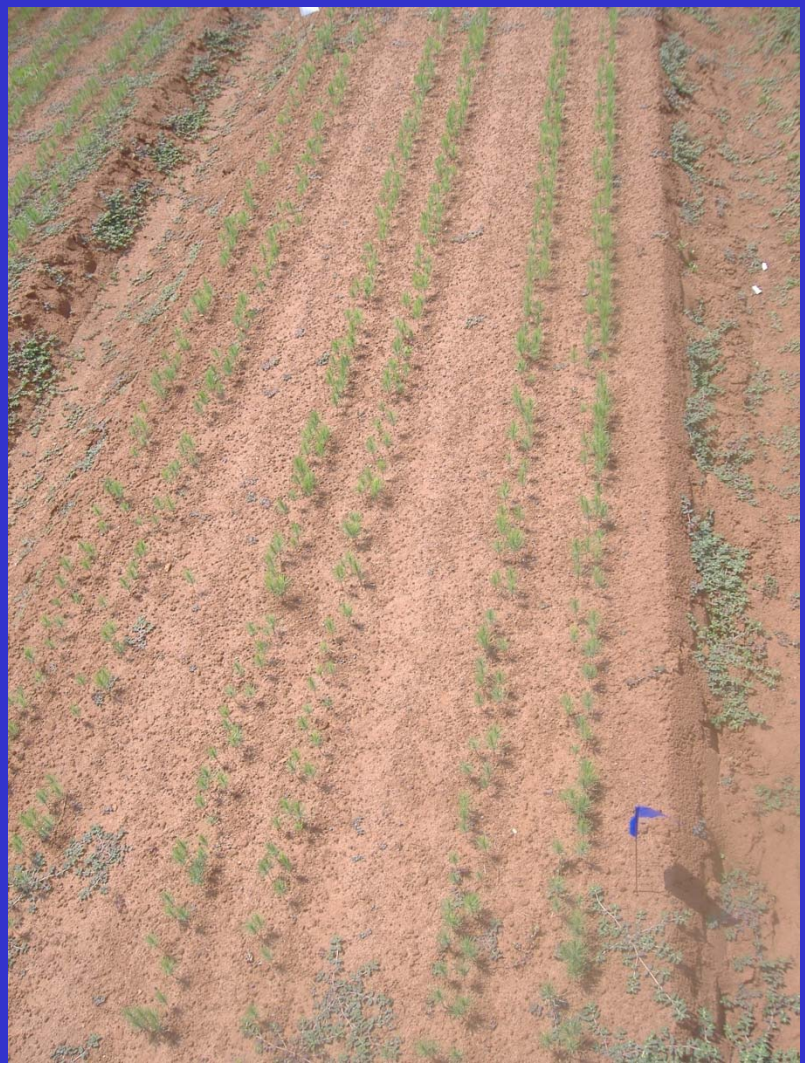
Control

SureGuard

May 28th

Control

Oust



May 28th

Control

Oryzalin

May 28th

Control

Pendulum

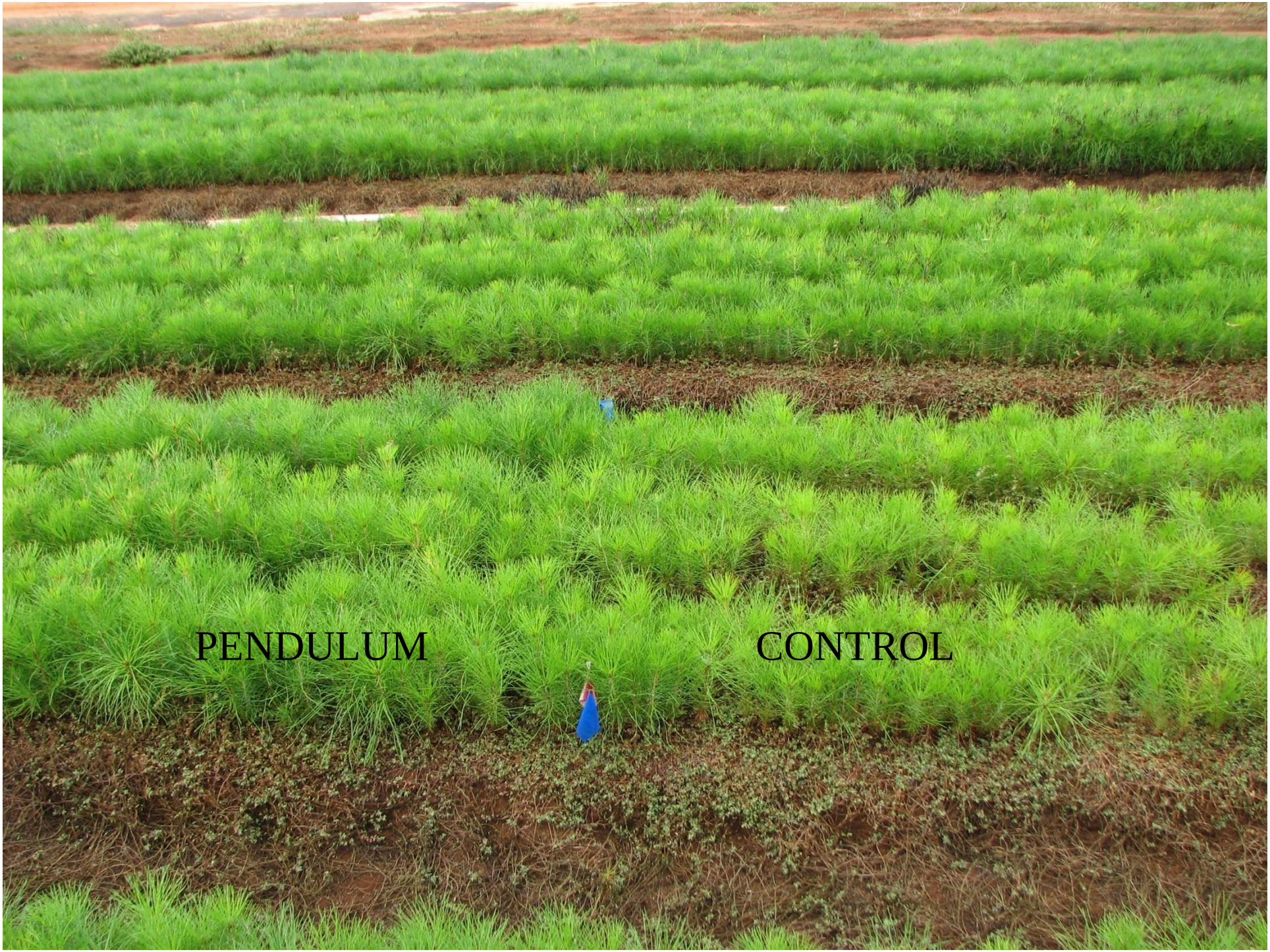
June 26th - % spurge cover

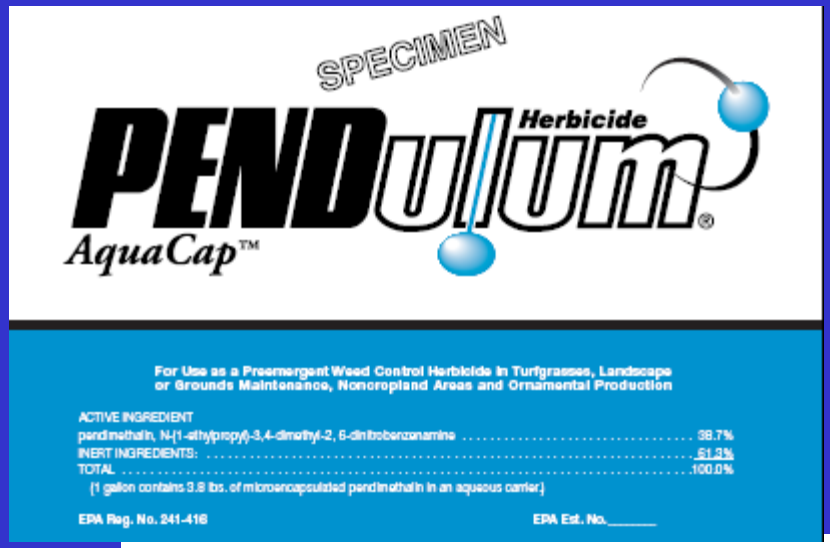
Control	--	95% a
Sureguard	6 oz	82% bc
Oryzalin	2 quarts	87% ab
Oust	1.33 oz	74% c
Pendulum	2 quarts	46% d

November 1

Control

Pendulum


PENDULUM
CONTROL



Established Container, or Field-Grown Nursery Stock[2, 3]	1. **DO NOT** apply during bud swell, bud break or at time of first flush of new growth. 2. Apply as a directed or over-the-top spray. 3 If newly budded or graphed rootstock, make an application using a shielded sprayer. 4. Care must be taken to ensure there are no cracks in the soil where **PENDULUM AquaCap** could come into contact with the roots.

Directed trials

4 years of directed herbicides

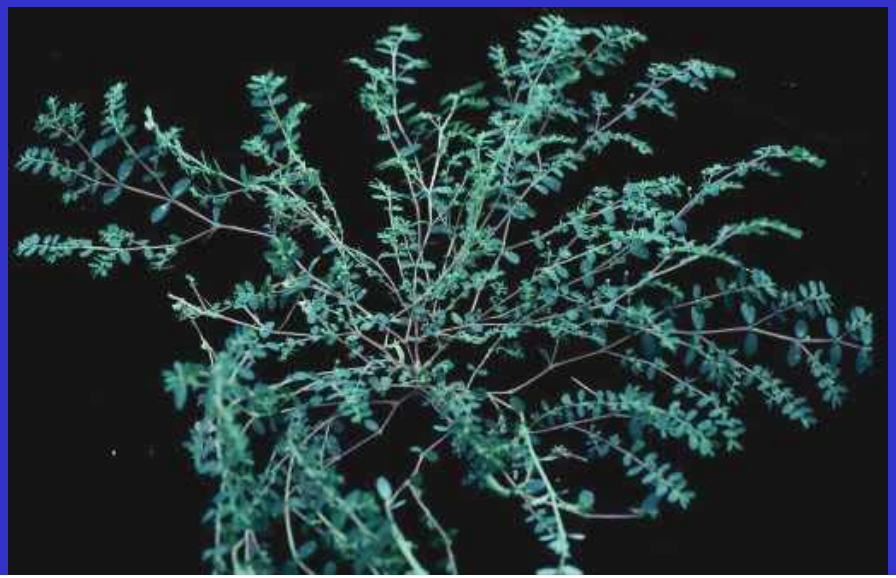
- Metsulfuron-methyl
- For prostrate spurge

- Halosulfuron-methyl
- For nutsedge

Sedgehammer™
TURF HERBICIDE

SEDGEHAMMER is a selective herbicide for the control of nutsedge and other weeds in turfgrass and landscaped areas

	% by Wt.
ACTIVE INGREDIENT:* Halosulfuron-methyl	75.0%
OTHER INGREDIENTS:	25.0%
Total:	100.0%



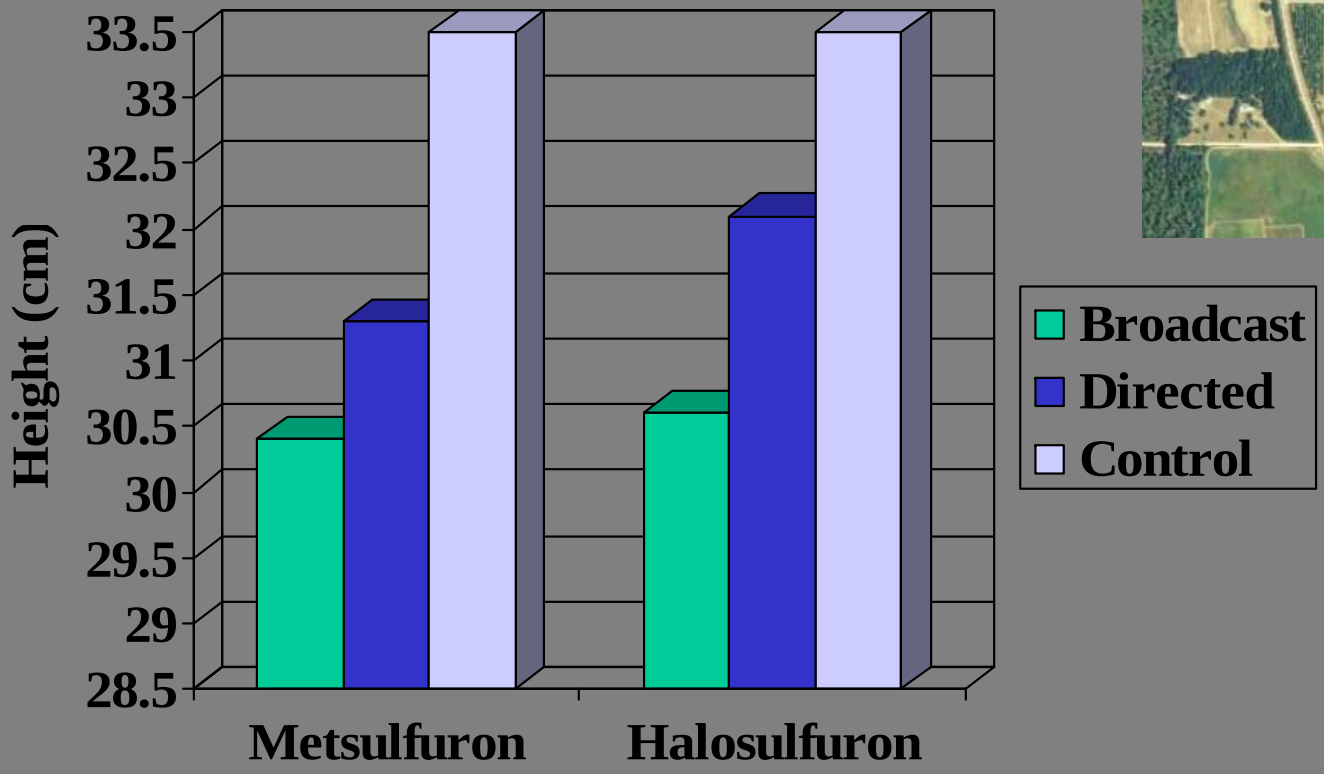
Directed Trials

- Elberta 2004
- Shubuta 2004
- Atmore 2004
- Elberta 2005
- Shubuta 2005
- Delano 2005
- Taylor 2006
- Flint River 2006
- Camden 2007
- Elberta 2007

Results

- Elberta 2004 Stunting -height
- Shubuta 2004 No stunting
- Atmore 2004 Lifted early
- Elberta 2005 Stunting -height
- Shubuta 2005 No stunting
- Delano 2005 Better than untreated hardwoods
- Taylor 2006 No stunting
- Flint River 2006 Stunting - RCD

2006


Height (cm)
33.5
33
32.5
32
31.5
31
30.5
30
29.5
29
28.5
Metsulfuron
Halosulfuron
Broadcast
Directed
Control


Flint River Nu

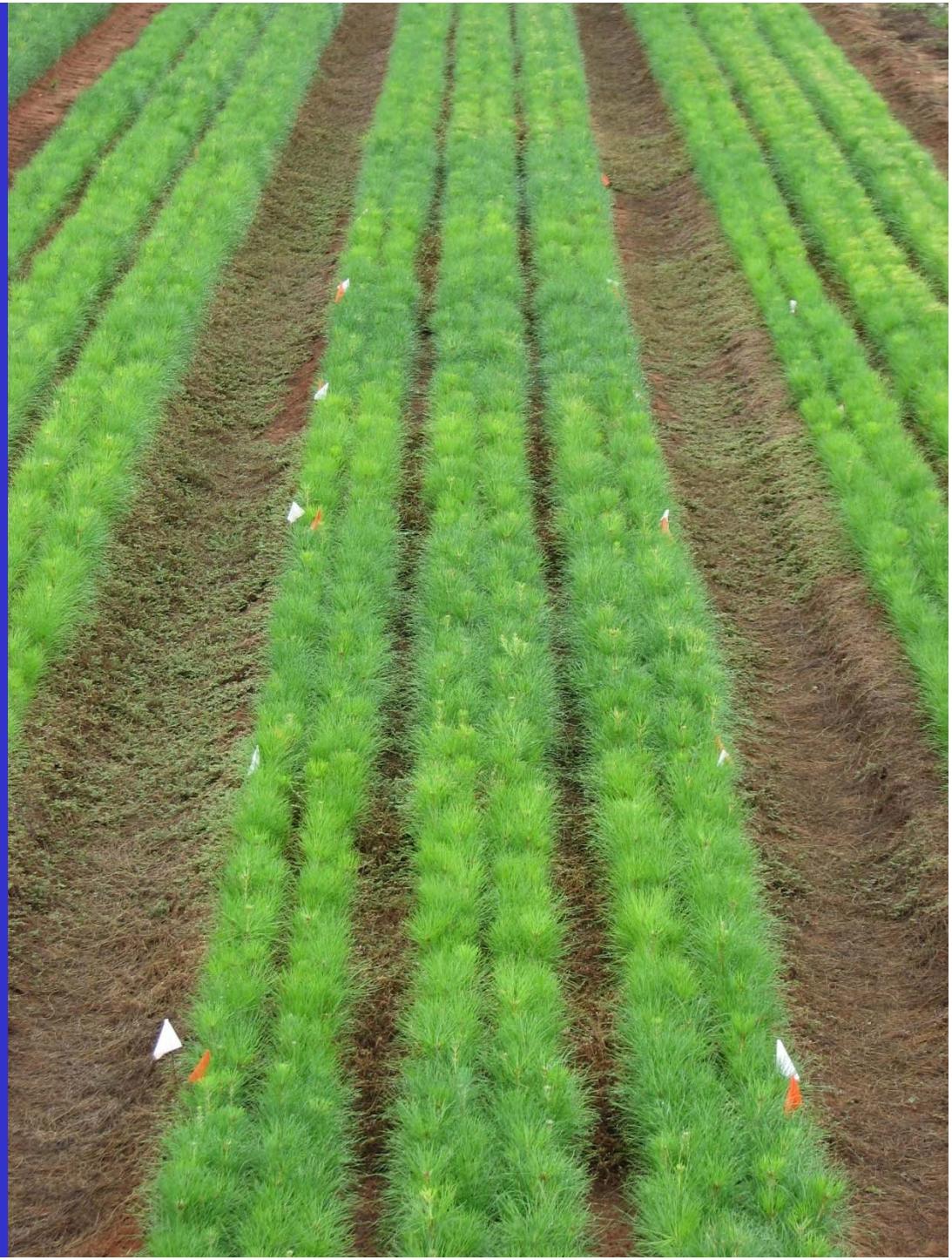

Sedgehammer 30 g a.i./acre
Control

metsulfuron (5.1 g ai/acre)
photo taken about 92 hours after application

broadcast | directed | control

Multiple applications of metsulfuron

0.2 oz product/acre
0.2
0.2



Metsulfuron methyl

1 application

3 applications

ESCORT® XP may be applied on conifer and hardwood plantations, and noncrop sites that contain areas of temporary surface water caused by the collection of water **between planting beds, in equipment ruts**, or in other depressions created by management activities.

BUT YOU MUST HAVE THE SUPPLEMENTAL LABEL.

Equipment rut

Metsulfuron 60EG IVM (Arysta) may be applied on conifer and hardwood plantations, and may be applied to

woody plants in noncrop areas.

But be sure you have the Arysta Label – Turf and Ornamental

Product	Manufacturer	Category
Metsulfuron 60 EG AG	Arysta LifeScience North America Corporation	Agriculture/Crop Protection Labels & MSDS - USA
Metsulfuron 60 EG IVM	Arysta LifeScience North America Corporation	Turf & Ornamental / Non-Crop Labels & MSDS - USA
Metsulfuron 60EG AG	Micro Flo Products (Arysta LifeScience)	Agriculture/Crop Protection Labels & MSDS - USA
Metsulfuron 60EG IVM	Micro Flo Products (Arysta LifeScience)	Turf & Ornamental / Non-Crop Labels & MSDS - USA
FarmSaver Metsulfuron Methyl 60 DF	MANA - Makhteshim Agan of North America, Inc.	Agriculture/Crop Protection Labels & MSDS - USA
Metsulfuron Methyl DF	Vegetation Management LLC	Turf & Ornamental / Non-Crop Labels & MSDS - USA

- Do not contaminate any body of water, including irrigation water.
- Keep from contact with fertilizers, insecticides, fungicides and seeds.

After product application, the sprayer MUST NOT be used for crop applications. It is imperative that this precaution is followed because most crops (except small grains) can be destroyed or baldy damaged by low rates of METSULFURON 60EG IVM.

GENERAL INFORMATION

METSULFURON 60EG IVM is a dispersible granule that is applied as a spray after being mixed in water. METSULFURON 60EG IVM can be used to control the following:

- Annual weeds
- Conifer plantations
- General weeds and brush on industrial non-crop sites
- Perennial weeds
- Selective weeds in certain types of unimproved turf grasses on industrial sites and in native grasses
- Weeds and hardwoods in conifer plantations
- Woody plants in noncrop areas

Optimum control over foliage is achieved after emergence or dormancy break, although METSULFURON 60EG IVM does have preemergence activity. Except as specified, optimum control is achieved when applied to young, actively growing weeds. The weed species and size at the time of application will determine use rate.

Several factors will influence the degree and duration of control, including weed spectrum and infestation intensity, weed size at application, environmental conditions at and following treatment, soil pH, soil moisture, and soil organic matter

METSULFURON 60EG IVM can be applied to floodplains where surface water is not present, terrestrial areas of deltas and low lying areas where water is drained but may be isolated in pockets due to uneven or unlevel conditions.

METSULFURON 60EG IVM is noncorrosive, nonflammable, nonvolatile and does not freeze.

Conclusions

An application of metsulfuron methyl (0.1 to 0.2 oz product/acre) can reduce the population of prostrate spurge (and a Supplemental Label allows the use in alley ways).

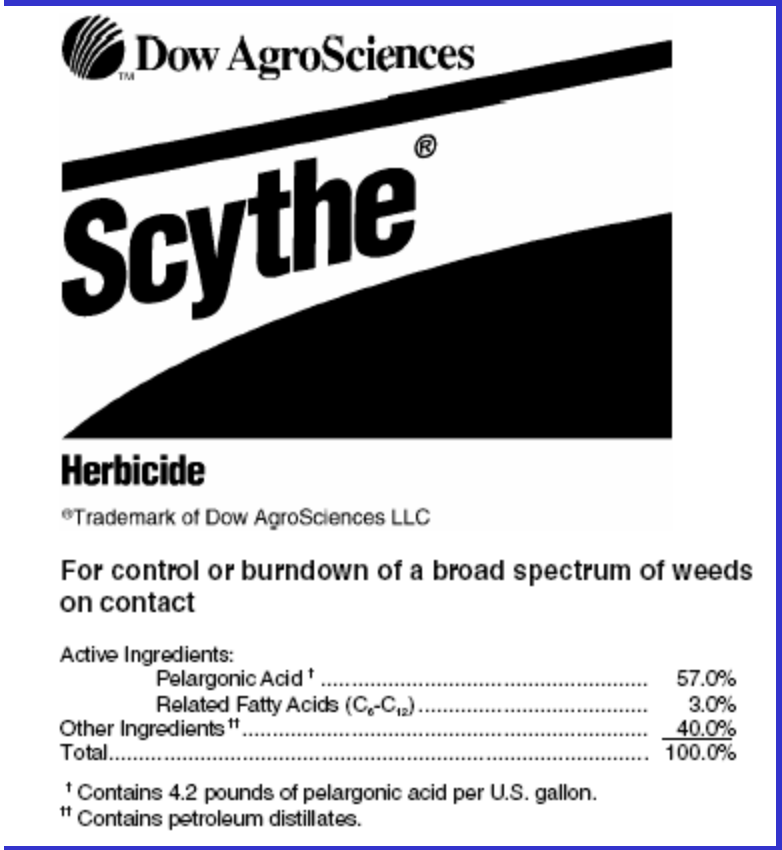
On some soils, using a directed applicator can increase seedling tolerance to metsulfuron-methyl.

Stunting may be increased when soil pH is >6.

On some soils, halosulfuron-methyl (30 g ai /acre 1.4 oz product/acre) will stunt seedlings even when using a directed sprayer.

Questions?

Scythe trials



Dow AgroSciences

Scythe®

Herbicide

®Trademark of Dow AgroSciences LLC

For control or burndown of a broad spectrum of weeds on contact

Active Ingredients:	
Pelargonic Acid †	57.0%
Related Fatty Acids (C_6-C_{12})	3.0%
Other Ingredients ††	40.0%
Total	100.0%

† Contains 4.2 pounds of pelargonic acid per U.S. gallon.
†† Contains petroleum distillates.

4% Broadcast = 1 gal/a
8% Broadcast = 2 gal/a
8% Directed = 2 gal/a

Visible effects occur within hours. Made of natural fatty acids,

Scythe Herbicide works by removing or “burning” the waxy cuticle of green vegetation.

1 gallon/acre

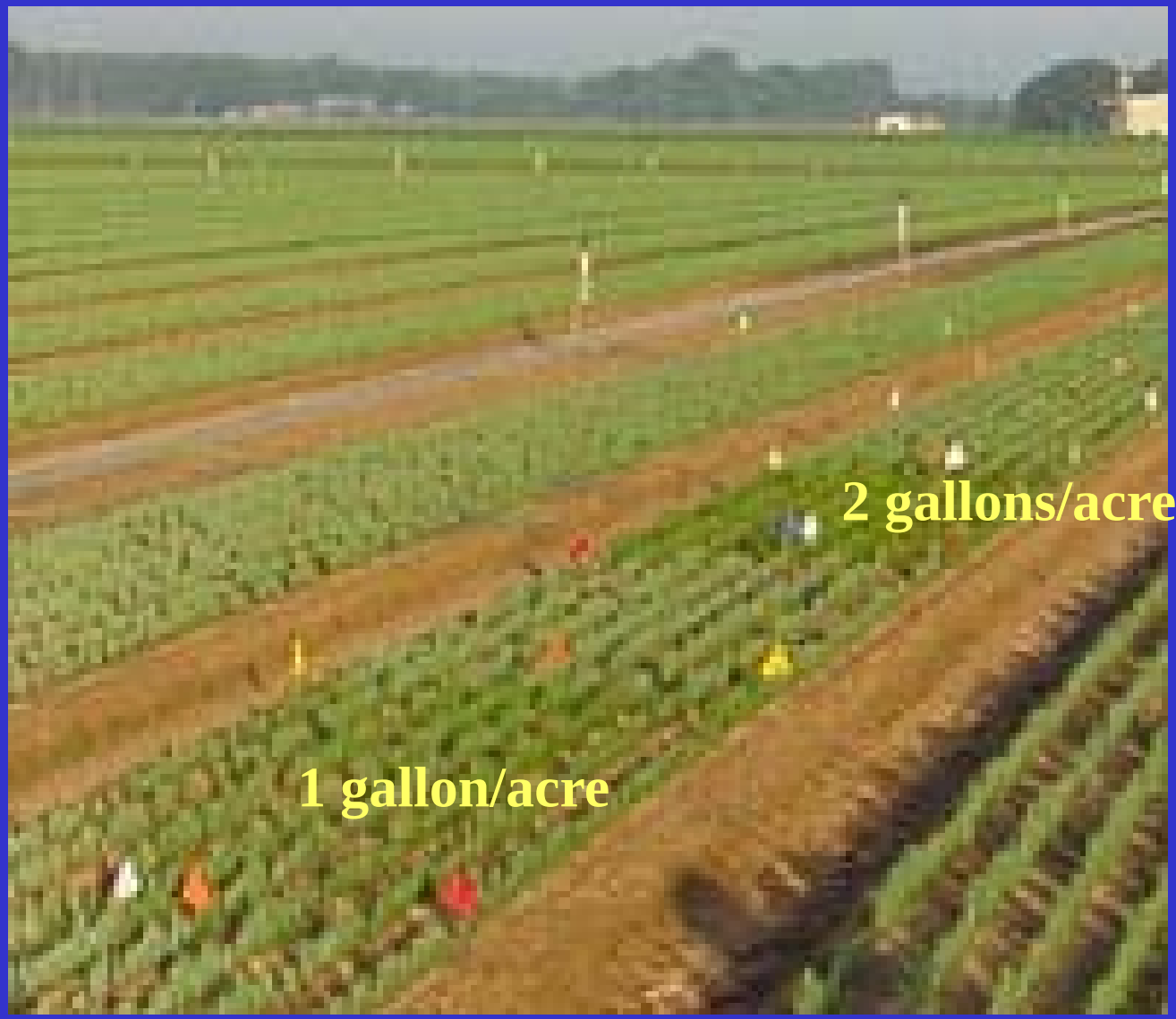
2 gallons/acre

2 gallons/acre

4 gallons/acre

As with many herbicides, AI/acre is more important than percentage….

Scythe Plots taken about 16 hours after application



Scythe Plots taken about 3 hours after application

Scythe Plots taken about 16 hours after application

Scythe Plots taken about 92 hours after application

4%

8%

control

Scythe Plots taken about 92 hours after application

Broadcast

Directed

Trials with pelargonic acid

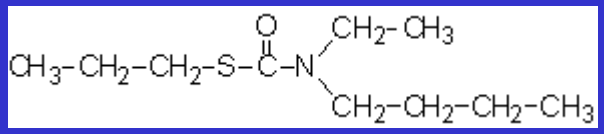
Non-Crop Use Sites and Use Methods

Use Methods: See the corresponding numbers in the "Use Methods" section under "General Information" for use descriptions and precautions.

Non-Crop Group	Non-Crop Use Sites	Use Methods
Turf, Flowers, Bedding and Landscape Plants	Turfgrass (maintenance, sod or seed production), bedding plant, flowers, and ornamentals	1,2,3,4,5,6
Trees and Shrubs	Christmas trees, forest and commercial trees, landscape trees, nursery trees or shrubs, and fiber farms	1,2,5
Greenhouse and Indoor Use	All crops, plants, and structures	1,2,3,7
Non-Crop, Industrial, and Public Areas	Farmstead, homestead, fallow land, storage areas, schools, paved areas, rights-of-way (*e.g.*, road, railroad, utilities), parking lots, recreation areas (*e.g.*, athletic fields, campgrounds, golf courses, playgrounds), walks, industrial sites (*e.g.*, lumberyard, tank farms, buildings).	1,2,7
Structures, Buildings, and Walkways	Bench, deck, equipment, floor, roof, wall, walks, and evaporative cooling pads.	7
Dry Aquatic Sites, Dry Drainage Systems and Around Aquatic Sites	Applications must be made 72 hours prior to reflooding of dry aquatic sites. Dry ditches, dry canals, ditch banks, and for use above the water line or after drawdown of agricultural irrigation water and ditch systems, industrial ponds and disposal systems, and impounded water areas.	1,7

1. **Vegetative Burndown:** General control of weeds for seedbed or site preparation, non-crop and around aquatic sites. Spot treatments may be used in crop and pasture situations.
2. **Directed and Shielded Sprays:** Applications may be made in and around desirable plants when contact of foliage and green bark is avoided.

5. **Sucker Control, Pruning and Trimming:** To burn back unwanted basal sucker growth on woody trees and foliage growth on vines, and excessive cane growth in brambles. Apply only to unwanted vegetative parts. Apply before suckers become woody.



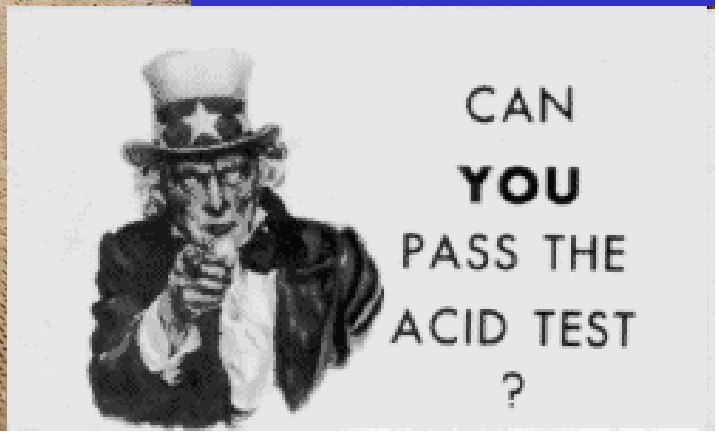
- 3-5% for annual weeds and vegetation
- 5-7% for perennial herbaceous and late stage annuals
- 7-10% for maximum vegetation burndown

1 Gallon = $50

8% = 2 Gallons plus 23 gallons of water = $100/acre
Scythe works better on warm sunny days when the temperature is above 70º F.

We have circumstantial evidence that water quality is important. Pond water may not work as well as drinking water.

Acid trials

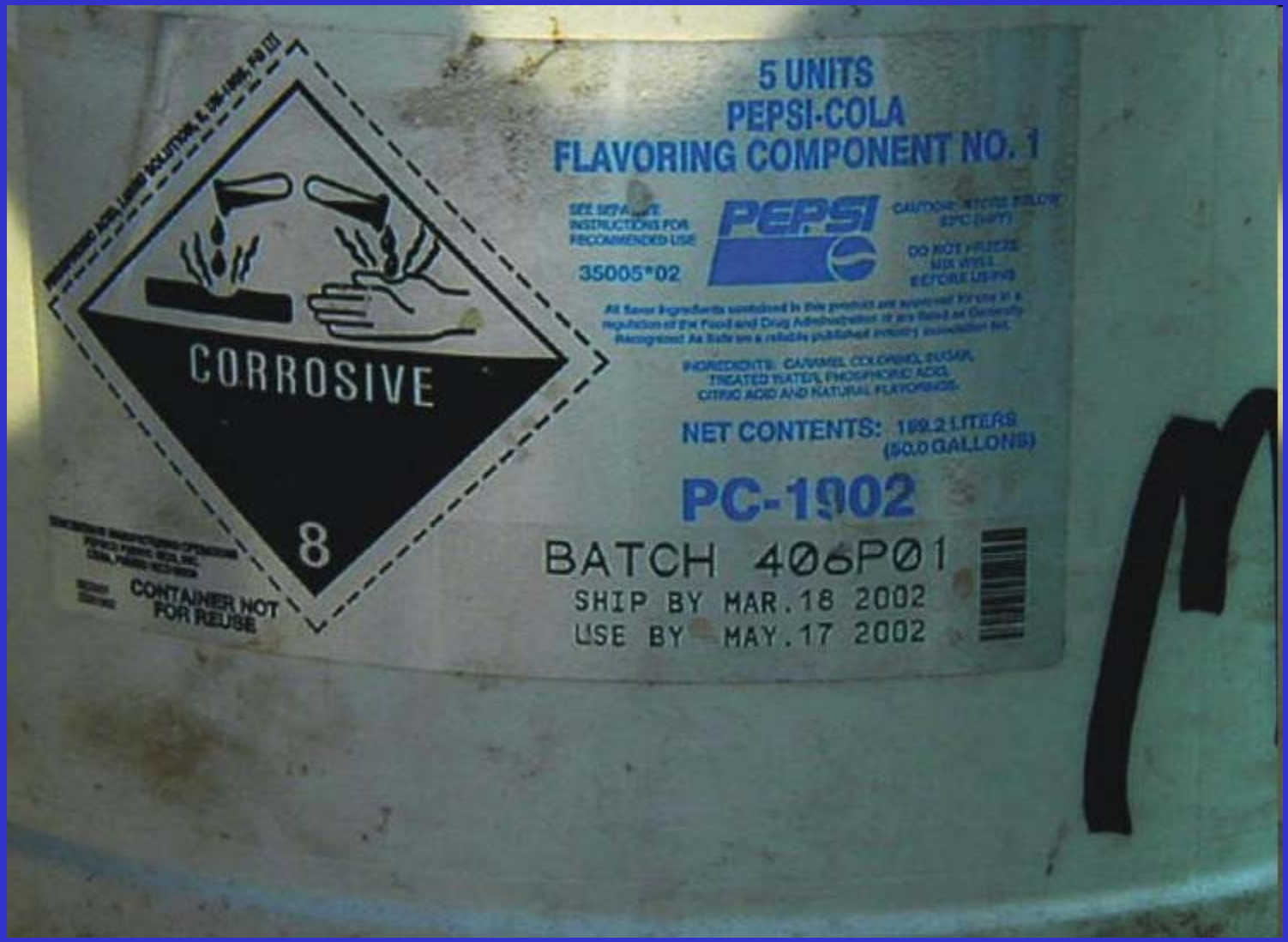


Acid herbicides

- **aromatic acid herbicides**
- **benzoic acid herbicides**
  chloramben
  dicamba
  2,3,6-TBA
  tricamba
  - **pyrimidinyloxybenzoic acid herbicides**
    bispyribac
    pyriminobac
  - **pyrimidinylthiobenzoic acid herbicides**
    pyrithiobac
- **phthalic acid herbicides**
  chlorthal
- **picolinic acid herbicides**
  aminopyralid
  clopyralid
  picloram
- **quinolinecarboxylic acid herbicides**
  quinclorac
  quinmerac

Acid herbicides

- pelargonic acid - $C_9 H_{18} O_2$ (4-8%)
- acetic acid - $CH_3 COOH$ (10%)
- nitric acid - HNO_3 (4-8%)
- phosphoric acid - $H_3 PO_4$ (3-6%)
- sulfuric acid - $H_2 SO_4$ (5?)


5 UNITS
PEPSI-COLA
FLAVORING COMPONENT NO. 1
PEPSI
35005*02
CORROSIVE
8
CONTAINER NOT FOR REUSE
NET CONTENTS: 189.2 LITERS (50.0 GALLONS)
PC-1902
BATCH 406P01
SHIP BY MAR.18 2002
USE BY MAY.17 2002

United States
Department of
Agriculture

Forest Service

Southern Forest
Experiment Station

Research Note

so-307
Mav 1984

Nitric Acid and Benomyl Stimulate Rapid Height Growth of Longleaf Pine

A. G. Kais, R. C. Hare, and J. P. Barnett

Table 1.-Survival, *infection, and vigor of containerized* ***longleaf*** *pine seedlings and weed control after 1 year in the field*

Dip and acid treatments	Survival	Brown-spot infection	Vigor index[1]	Weed index[2]
		percent		
0 nitric acid	66.3 d[3]	39.6 a	2.6 d	2.4 a
4% nitric acid	67.8 cd	28.3 b	3.3 bc	1.3 b
6% nitric acid	85.6 ab	29.6 ab	3.6 abc	1.1 b
Mean	73.2	32.5	3.2	1.6

[1]Vigor index; 1 = poor, 2 = fair, 3 = good, and 4 = excellent.

[2]Weed competition index; 1 = none, 2 = slight, 3 = moderate, and 4 = severe.

[3]For each parameter, values in the same column followed by the same letter are not significantly different (P = 0.05). Each treatment value is the mean of 6 blocks of 30 seedlings each.

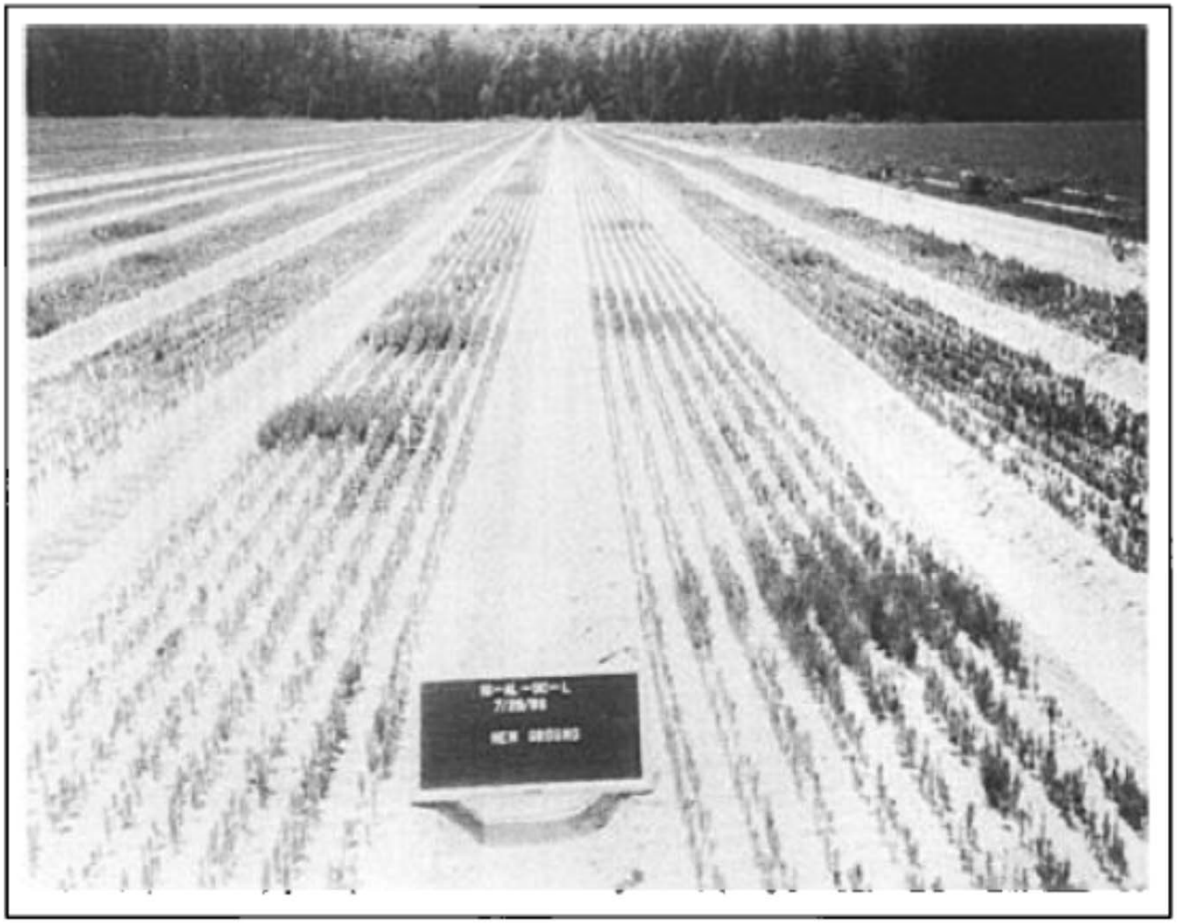


Figure 1. Ectomycorrhizal deficiency symptoms in new ground at the Inverness Nursery at Union Springs, Alabama in 1986. (Note the proximity of the mixed stand of pines, oaks, and hardwoods in background).

Phosphorus fertilization was accomplished by applying dilute (3% w/w) H_3PO_4 at a rate of 18.3 g of phosphorus/m^2. Three weeks after treatment, sample seedlings were removed from each plot and used to determine heights, shoot dry weight, and root dry weight.

	Three weeks after treatment								
	Foliar nutrients						Shoot weight	Root weight	Height (mm)
	N	P	S	K	Mg	Ca			
	..... (%)						..... (mg)		(mm)
H_3PO_4	2.3	0.25	0.13	0.97	0.08	0.23	221	47	90
Control	2.3	0.08	0.10	1.02	0.11	0.28	148	31	79
$P > F^1$	0.629	0.001	0.001	0.085	0.001	0.019	0.007	0.062	0.044

[1] Probability of a greater *F* value.
[2] A cull is a seedling with a root-collar diameter less than 3.2 mm.

163 lbs P/acre

The Effect of Acid Rain on the Defense Response of Pines to Pinewood Nematodes

Ei-ichiro ASAI, Kazuyoshi FUTAI
Graduate School of Agriculture, Kyoto University, Kyoto, 606-8502, JAPAN

Abstract - We examined the invasion rate of virulent and avirulent isolates of the pinewood nematode to Japanese black pine seedlings pretreated with simulated acid rain (SAR) at pH 3 and 2. Pretreatment with SAR at pH 3 reduced the invasion rate of virulent nematodes compared to control seedlings in both juvenile seedlings and 1-year-shoot segments of 3-year-old seedlings. This suggests that acid rain at pH 3 activates some defense response(s) of pines to the nematodes.••

or distilled water (W) for two months. Acidic solution for SAR was prepared by mixing 0.5 M sulfuric acid and nitric acid at an S : N ratio of 3 : 1, and the solution was adjusted to pH 3 or 2. Seedlings were divided into the following four groups. In the pH 2-T group, only the top of the seedling was sprayed with pH 2 SAR three times a week. In the pH 2-TR and pH 3-TR groups, the top of the seedling was also sprayed with SAR (pH 2 and 3, respectively) twice a week, and the root was also exposed to SAR (pH 2 and 3, respectively) once a week. Control seedlings (W) received

10% acetic acid (vinegar)

MATRATEC® AG

NON-SELECTIVE, POST EMERGENCE HERBICIDE
FOR AGRICULTURAL USE, FRUIT, NUT AND VEGETABLE CROPS

KEEP OUT OF REACH OF CHILDREN

CAUTION - PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail).

Use only according to label instructions. Read the entire label before using this product.

This product has not been registered by the US Environmental Protection Agency. Brandt Consolidated, Inc., represents that this product qualifies for exemption from registration under the Federal Insecticide, Fungicide, and Rodenticide Act.

FIRST AID

If in eyes: Flush with water for at least 15 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a physician if irritation persists.

If on skin or clothing: Wash exposed area with plenty of soap and water for at least 15 minutes. Remove contaminated clothing. Get medical attention if irritation persists.

If inhaled: Remove person to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

If swallowed: Rinse mouth out with water. Call a doctor or get medical attention as soon as possible. Do not induce vomiting. Do not give anything by mouth to an unconscious person. Avoid alcohol.

PHYSICAL OR CHEMICAL HAZARDS

Do not use, pour, spill or store near heat or open flames. Store only in original container.

CLAWEL
Specialty Products
A DIVISION OF BRANDT CONSOLIDATED, INC.
211 West Route 125
Pleasant Plains, IL 62677
800.300.6559
www.clawel.com

ACTIVE INGREDIENTS

Clove Oil	50.00%
Other Ingredients*	50.00%
Total	100.00%

* Wintergreen Oil, Butyl Lactate and Lecithin.

Ingredients in this product meet the requirements of the USDA National Organic Program.

USDA ORGANIC

EMULSIFIABLE CONCENTRATE
NO REENTRY INTERVAL

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

CAUTION

Avoid contact with eyes, skin, and clothing. Avoid breathing vapors or spray mist. Harmful if swallowed. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Persons applying this product should wear: Long sleeve shirts and long pants, shoes and socks, protective eyewear and chemical resistant gloves made of neoprene, nitrile or natural rubber.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries and greenhouses, and handlers of agricultural pesticides. It also contains specific instructions and exceptions pertaining to statements on this label about personal protective equipment (PPE). The requirements of this box only apply to uses of this product that are covered by the Worker Protection Standard.

NO REENTRY INTERVAL

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and involves contact with anything treated such as plants or soil is: Long sleeved shirt, long pants, shoes and socks, chemical resistant gloves.

NET CONTENTS

2.5 Gal. per bottle/9.46 liters

Questions?

Preemergence herbicide toxicity

Possible treatments

imazapic
oryzalin
atrazine
sulfometuron