Nursery Herbicide Trials
and
Field Chemical/Seedling Size Trials

David South

Past trials

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

Two directed herbicides

- Metsulfuron-methyl
- For prostrate spurge

- Halosulfuron-methyl
- For nutsedge

Vegetation Manager™

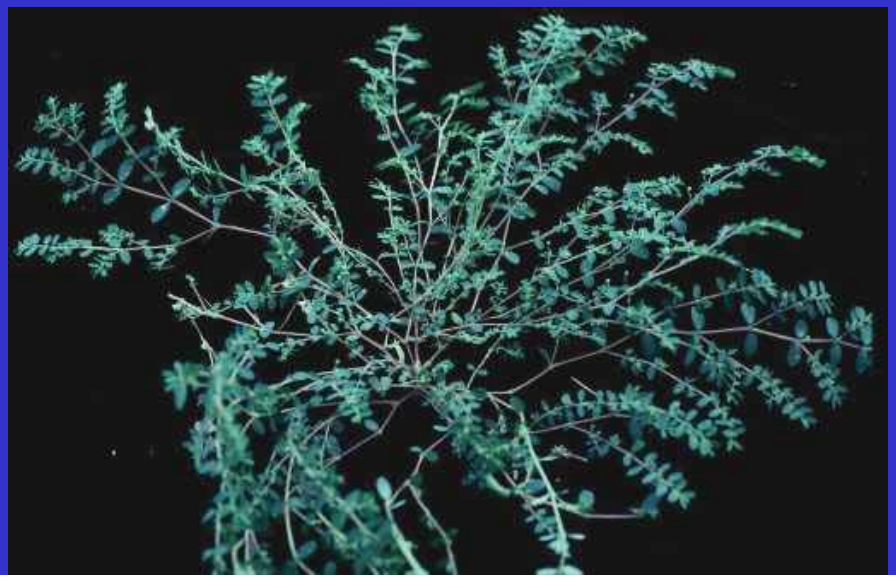
METSULFURON METHYL DF

DRY FLOWABLE

SPECIMEN LABEL

ACTIVE INGREDIENT:
METSULFURON METHYL
METHYL 2-[[[[(4-METHOXY-6-METHYL-1,3,5-TRIAZIN-2-YL)AMINO]-CARBONYL]AMINO]SULFONYL]BENZOATE 60%
INERT INGREDIENTS: 40%
TOTAL: 100%

DO NOT USE ON FOOD OR FEED CROPS EXCEPT AS RECOMMENDED



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

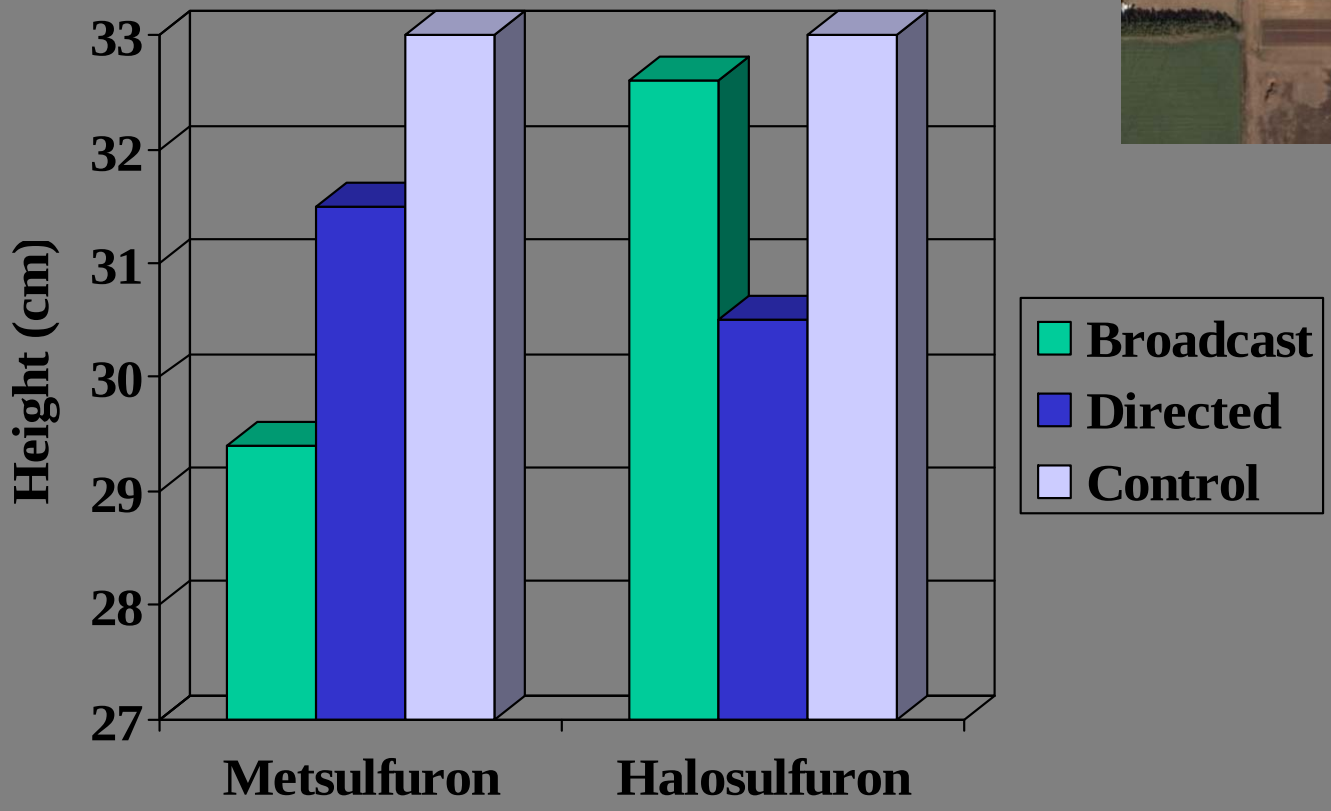
- Elberta 2004
- Shubuta 2004
- Atmore 2004
- Elberta 2005
- Shubuta 2005
- Delano 2005
- Taylor 2006
- Flint River 2006

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

2004


Comstock Rd

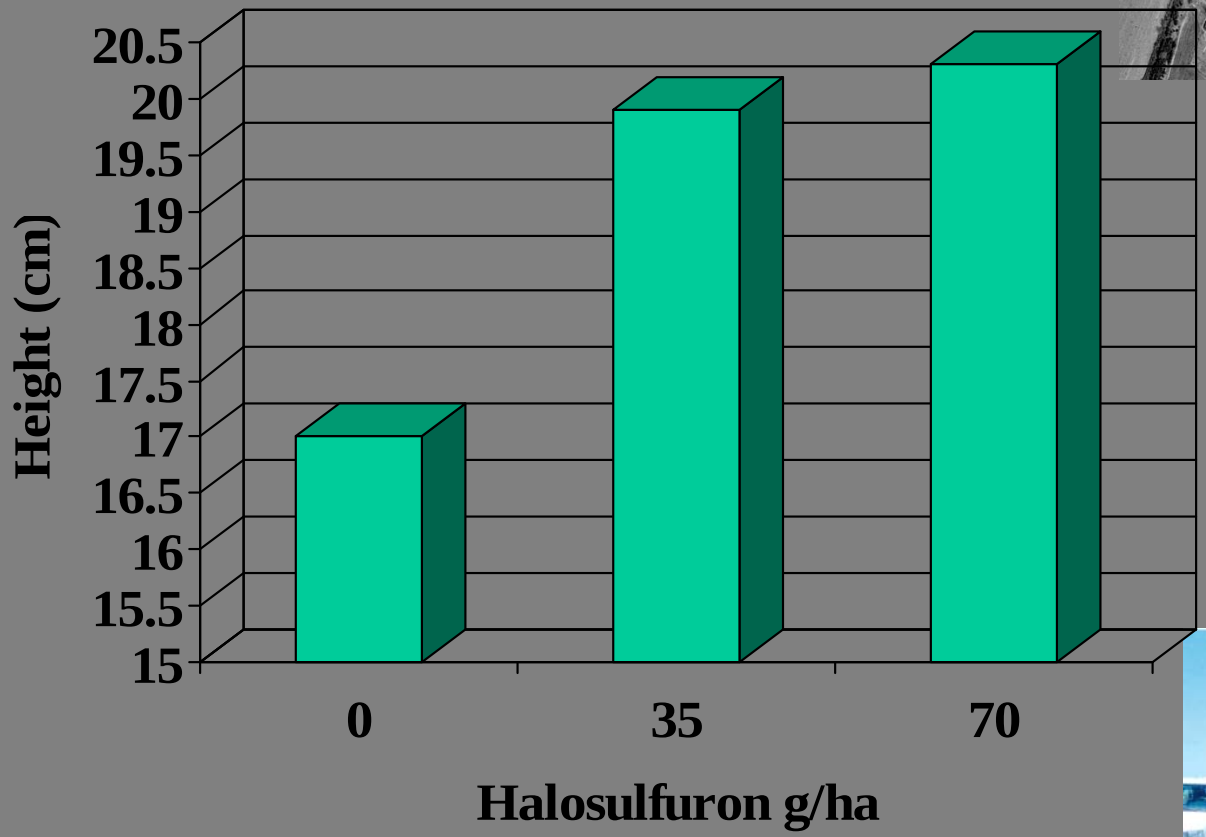

Height (cm)
33
32
31
30
29
28
27
Metsulfuron
Halosulfuron
Broadcast
Directed
Control

Conclusions

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

On some soils, using a directed applicator can increase seedling tolerance to metsulfuron-methyl (5.1 g ai/acre or 1.5x rate)

2005 – water-willow oak

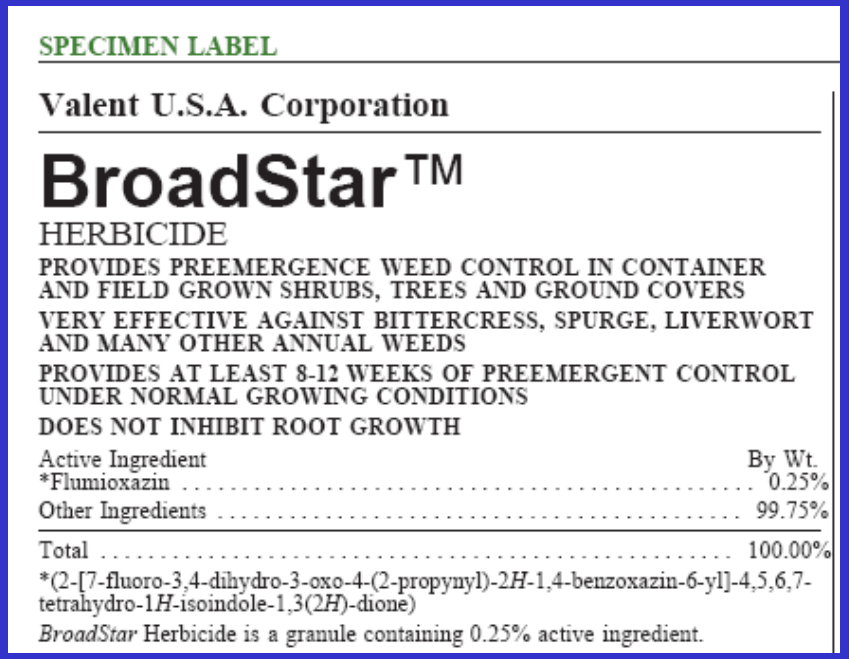


Two new herbicides

- flumioxazin
- Prostrate spurge
- National label

- dimethenamid-P

24-C Label in OR and WA



SPECIMEN LABEL

Valent U.S.A. Corporation

BroadStar™

HERBICIDE

PROVIDES PREEMERGENCE WEED CONTROL IN CONTAINER AND FIELD GROWN SHRUBS, TREES AND GROUND COVERS

VERY EFFECTIVE AGAINST BITTERCRESS, SPURGE, LIVERWORT AND MANY OTHER ANNUAL WEEDS

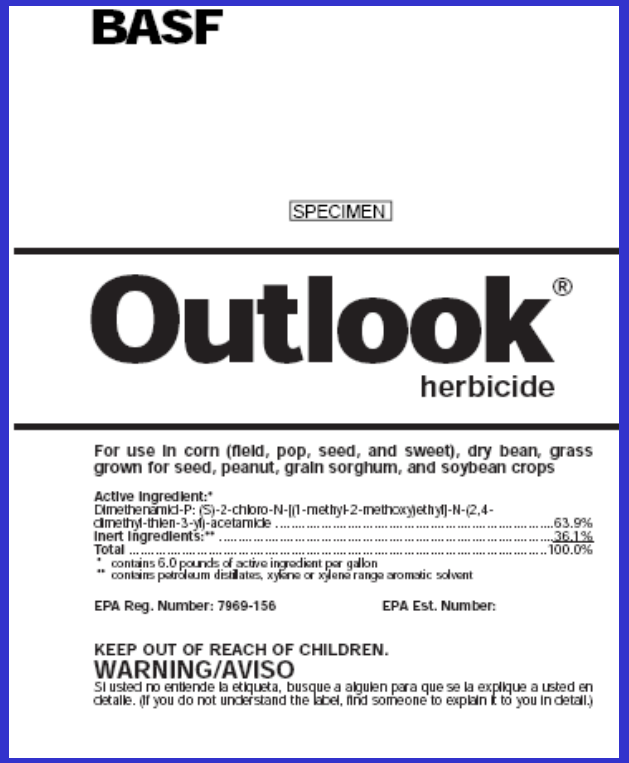
PROVIDES AT LEAST 8-12 WEEKS OF PREEMERGENT CONTROL UNDER NORMAL GROWING CONDITIONS

DOES NOT INHIBIT ROOT GROWTH

Active Ingredient	By Wt.
*Flumioxazin	0.25%
Other Ingredients	99.75%
Total	100.00%

*(2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2*H*-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1*H*-isoindole-1,3(2*H*)-dione)

BroadStar Herbicide is a granule containing 0.25% active ingredient.



BASF

SPECIMEN

Outlook®

herbicide

For use in corn (field, pop, seed, and sweet), dry bean, grass grown for seed, peanut, grain sorghum, and soybean crops

Active Ingredient:*

Dimethenamid-P: (S)-2-chloro-N-[(1-methyl-2-methoxy)ethyl]-N-(2,4-dimethyl-thien-3-yl)-acetamide	63.9%
Inert Ingredients:**	36.1%
Total	100.0%

* contains 6.0 pounds of active ingredient per gallon
** contains petroleum distillates, xylene or xylene range aromatic solvent

EPA Reg. Number: 7969-156 EPA Est. Number:

KEEP OUT OF REACH OF CHILDREN.

WARNING/AVISO

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.)

Broadcast Trials

- Elberta 2004
- Shubuta 2004
- Atmore 2004
- Elberta 2005
- Shubuta 2005

Results

- Elberta 2004 Stunting - Broadstar
- Shubuta 2004 Stunting – Broadstar
  Outlook-slight
- Atmore 2004 No stunting of oaks
- Elberta 2005 No stunting
- Shubuta 2005 No stunting

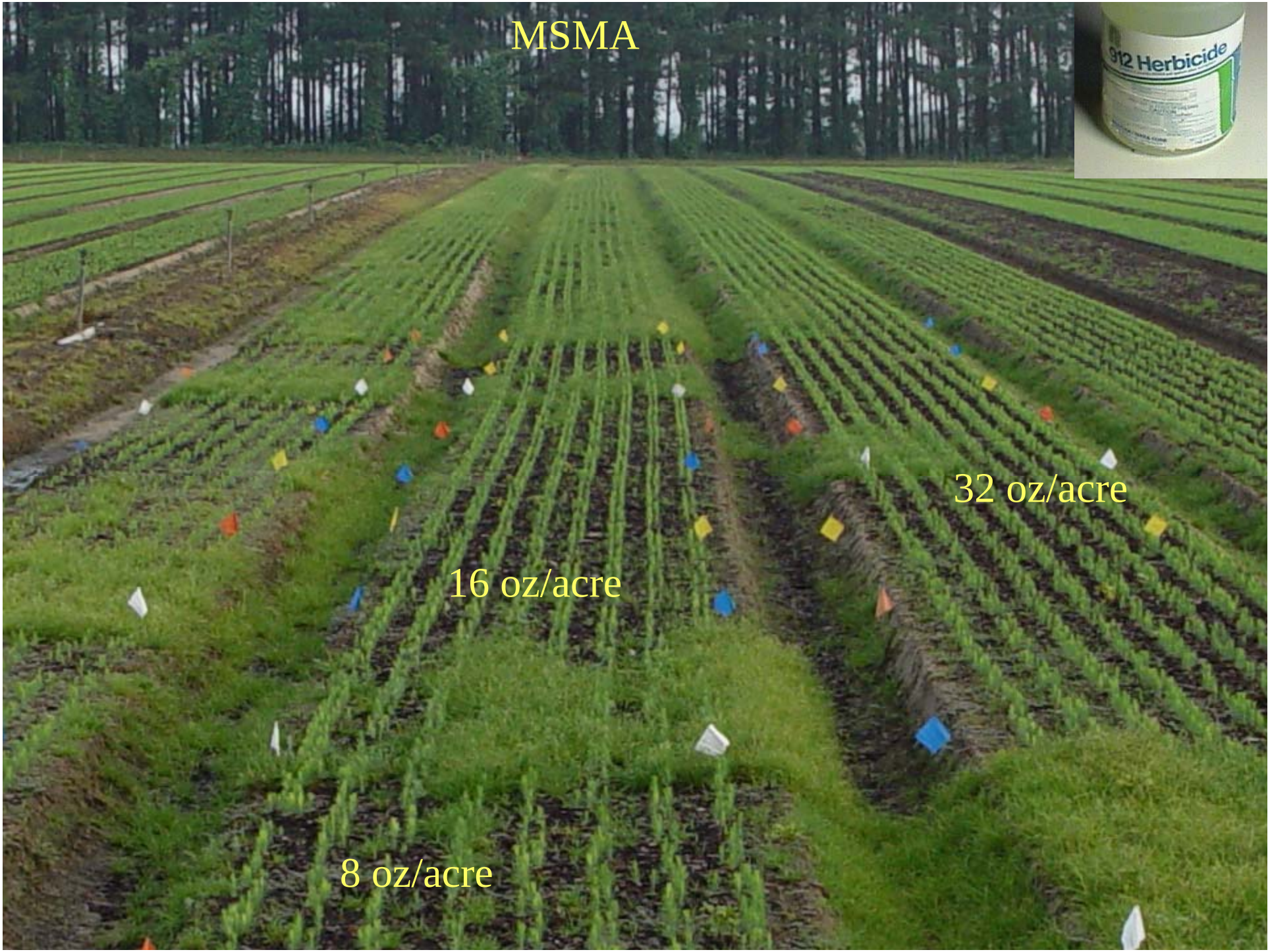
Conclusions

Stunting with flumioxazin occurred at one out of four pine trials. No injury was noted on oak seedlings.

Slight stunting with dimethenamid occurred only at one out of four pine trials. However, wording on 24-C labels state “Do not apply to forest tree seedbeds.”

MSMA Trials

- Taylor 2006
- Flint River 2006
- Alto 2006
- Rock Creek 2006
- Camden 2006


MSMA
312 Herbicide
32 oz/acre
16 oz/acre
8 oz/acre

MSMA 16 oz product/acre

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D.C., 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

PC Codes: 012501, 012502,
013802, 013803, 013806
DP Barcode: D309097
Date: March 29, 2006

DRINKING WATER ASSESSMENT

SUBJECT: Response to Registrant Phase I Error Only Comments:
Drinking Water Assessment for Organic Arsenical Herbicides for the Reregistration Eligibility Decision (RED)

These are not controlled studies. Nevertheless, considered as a group, they show a trend of groundwater arsenic at Florida golf courses well above local background levels and in many cases exceeding the federal MCL. Although evidence of the source of arsenic is generally not conclusive, pesticide application is a probable contributor to these levels, and in some cases, appears to be the likely source. The registrants and the State of Florida are currently negotiating a plan for a prospective groundwater study designed to investigate potential leaching of organic arsenicals in this vulnerable setting. This study is expected to lead to more conclusive evidence of whether or not applied arsenicals may reach groundwater.

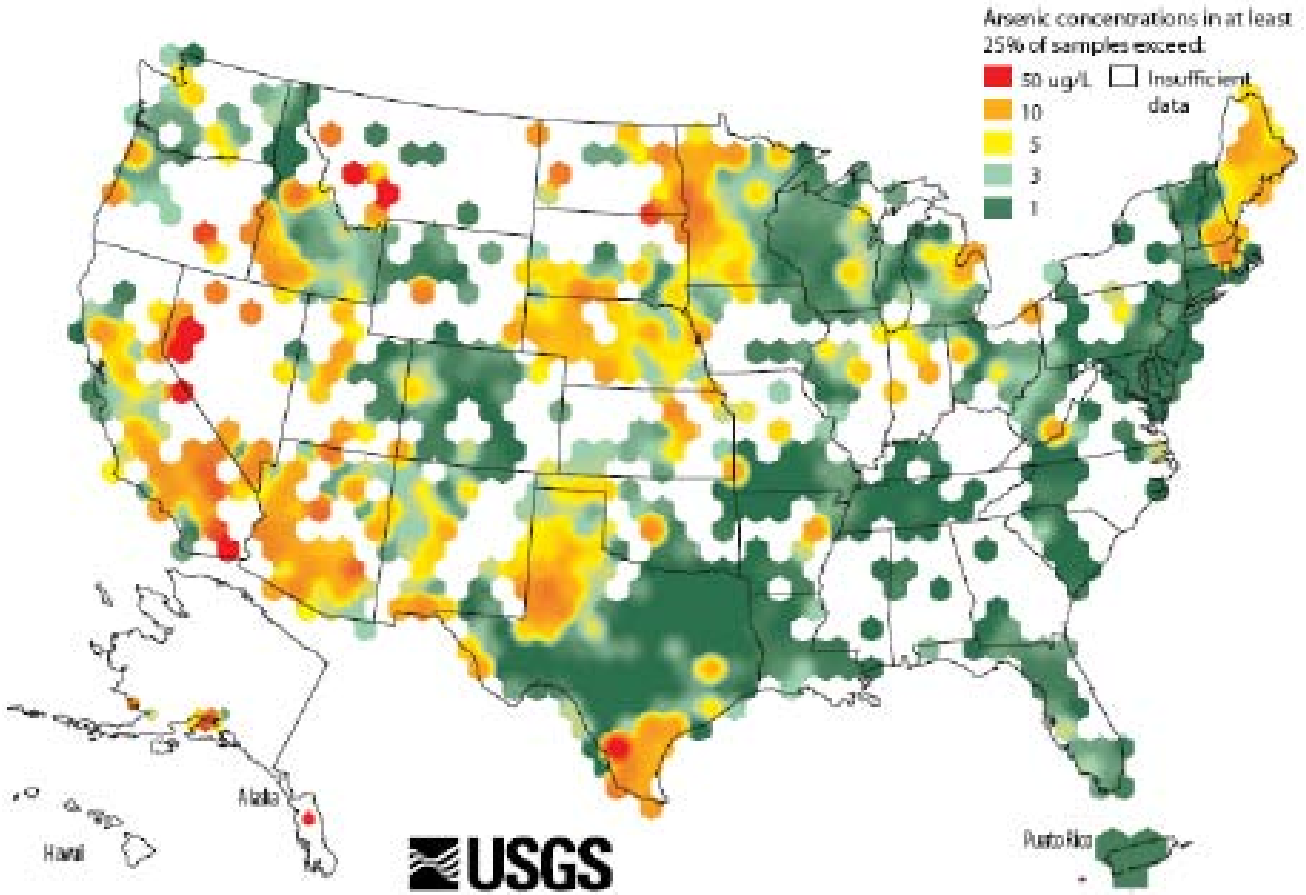


Figure 1. Arsenic in Groundwater in the United States. Equal-area map representing arsenic concentrations found in at least 25% of ground-water samples within a moving 50km radius, based on USGS NAWQA data. (Ryker, 2001).

Dated: August 2, 2006.

Debra Edwards,

Director, Special Review and Reregistration Division, Office of Pesticide Programs.

[FR Doc. E6–12896 Filed 8–8–06; 8:45 am]

BILLING CODE 6560–50–S

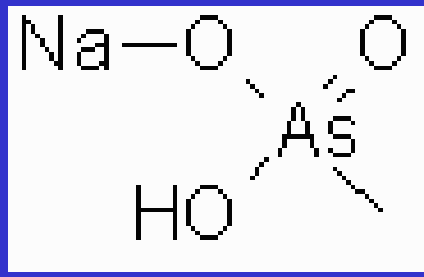
ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OPP–2006–0201; FRL–8085–9]

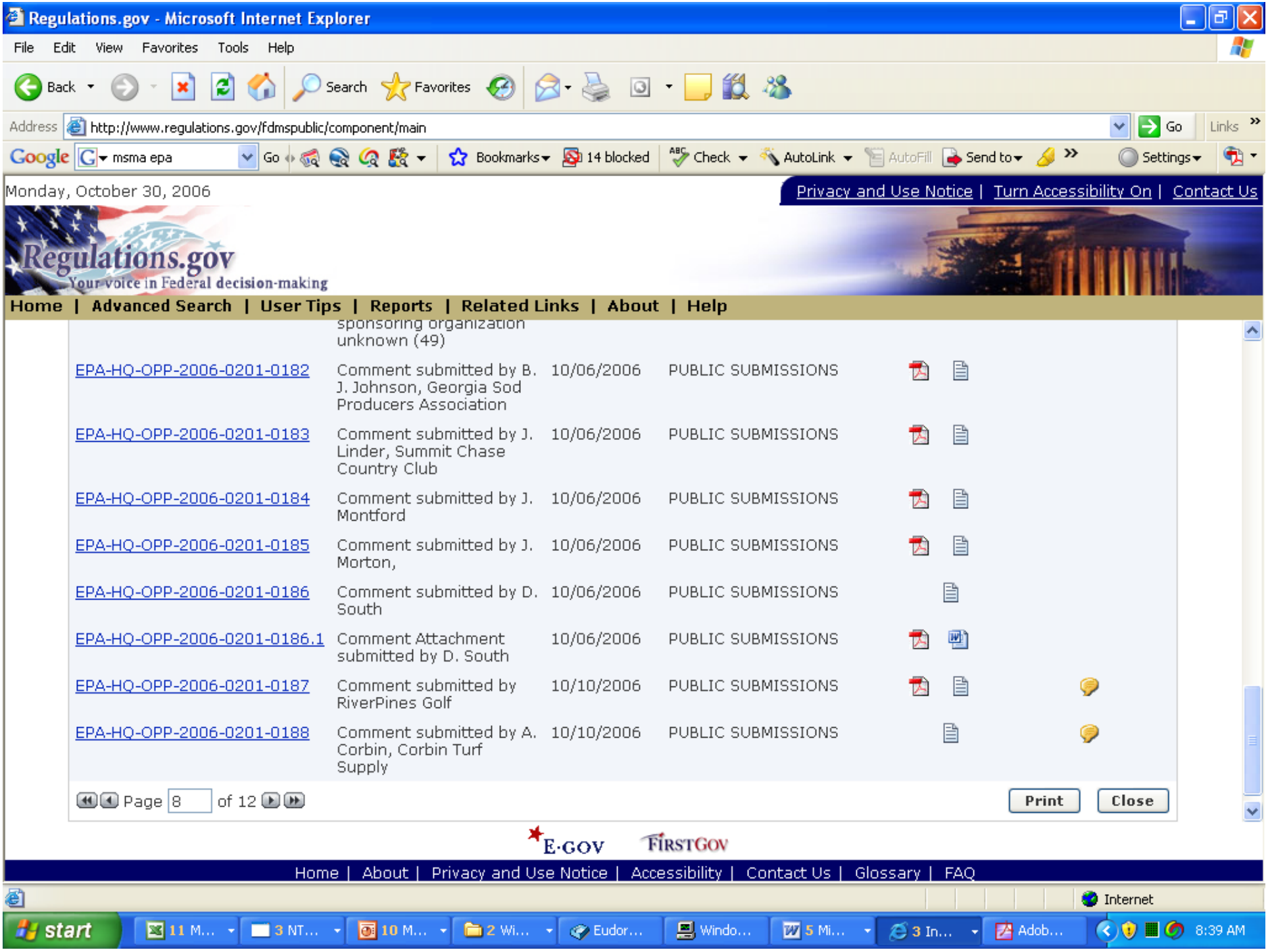
Organic Arsenical Herbicides (MSMA, DSMA, CAMA, and Cacodylic Acid), Reregistration Eligibility Decision; Notice of Availability

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.



document. The Agency has determined that all products containing MSMA, DSMA, CAMA, and cacodylic acid are not eligible for reregistration. The


Regulations.gov - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://www.regulations.gov/fdmspublic/component/main
Go Links
Google msma epa Go Bookmarks 14 blocked Check AutoLink AutoFill Send to Settings
Monday, October 30, 2006
Privacy and Use Notice | Turn Accessibility On | Contact Us
Regulations.gov
Your voice in Federal decision-making
Home | Advanced Search | User Tips | Reports | Related Links | About | Help
sponsoring organization unknown (49)
EPA-HQ-OPP-2006-0201-0182 Comment submitted by B. J. Johnson, Georgia Sod Producers Association 10/06/2006 PUBLIC SUBMISSIONS
EPA-HQ-OPP-2006-0201-0183 Comment submitted by J. Linder, Summit Chase Country Club 10/06/2006 PUBLIC SUBMISSIONS
EPA-HQ-OPP-2006-0201-0184 Comment submitted by J. Montford 10/06/2006 PUBLIC SUBMISSIONS
EPA-HQ-OPP-2006-0201-0185 Comment submitted by J. Morton, 10/06/2006 PUBLIC SUBMISSIONS
EPA-HQ-OPP-2006-0201-0186 Comment submitted by D. South 10/06/2006 PUBLIC SUBMISSIONS
EPA-HQ-OPP-2006-0201-0186.1 Comment Attachment submitted by D. South 10/06/2006 PUBLIC SUBMISSIONS
EPA-HQ-OPP-2006-0201-0187 Comment submitted by RiverPines Golf 10/10/2006 PUBLIC SUBMISSIONS
EPA-HQ-OPP-2006-0201-0188 Comment submitted by A. Corbin, Corbin Turf Supply 10/10/2006 PUBLIC SUBMISSIONS
Page 8 of 12
Print Close
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Internet
start
11 M... 3 NT... 10 M... 2 Wi... Eudor... Windo... 5 Mi... 3 In... Adob...
8:39 AM

Cotton, Weed Science Extension Specialist
Virginia Tech

West Tennessee Res. & Education Center
University of Tennessee

Andy Kendig
Weed Science Extension Specialist
University of Missouri

William B. McCloskey
Associate Specialist, Weed Science
University of Arizona

Don S. Murray
Professor
Weed Science Research
Oklahoma State University

Michael Patterson
Professor
Weed Science Extension Specialist
Auburn University

Dan Poston
Associate Professor
Extension Specialist
Mississippi State University

Kenneth L. Smith
Professor
Weed Science Extension Specialist
University of Arkansas

Larry Steckel
Assistant Professor
Weed Science Extension Specialist
University of Tennessee

Sandy Stewart
Associate Professor
Cotton Extension Specialist
Louisiana State University

David Teem
Professor, Weed Science
Auburn University

Steve Wright
Farm Advisor – Tulare and Kings Counties
Cotton and Weed Control Extension
University of California

P. Roy Vidrine
Professor, Weed Science
Louisiana State University

Cotton and turf?

We would like to suggest a compromise on the issue for cotton as follows:

1. Discontinue registrations for all organic arsenical herbicides except MSMA. MSMA is the most important of these herbicides for cotton growers.
2. Designate MSMA as a restricted use herbicide in cotton. This would allow application only by licensed applicators trained in the proper use of pesticides.
3. Discontinue registration of MSMA for preplant application in cotton.
4. Restrict use to only postemergence-directed applications by ground equipment.
5. Restrict use of MSMA to two applications per year, with a seasonal total of 4 lb active ingredient. Use could be further restricted to one application per year on soils with high potential for groundwater contamination.

Conclusions

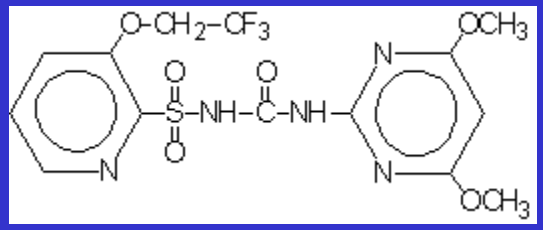
Pines have tolerance to MSMA and this herbicide can selectively control Cyperus compressus in pine seedbeds.

Due to concerns about arsenic, the availability of MSMA for use in non-crop areas will likely be limited.

Future trials

Two directed trials with halosulfuron, metsulfuron and pelargonic acid

3 trials with trifloxsulfuron sodium



Herbicides	Rates*	Four-leaf stage	
		Johnsongrass	Yellow nutsedge
	g/ha	%	
Trifloxysulfuron	21	44 b	55 bc
Trifloxysulfuron	42	89 a	67 b
Trifloxysulfuron	63	95 a	68 b
Trifloxysulfuron	21 + S	94 a	67 b
Trifloxysulfuron	42 + S	97 a	84 a
Trifloxysulfuron	63 + S	98 a	88 a
Glyphosate	280	20 c	13 e
Glyphosate	560	61 b	34 d
Glyphosate	840	97 a	50 c
LSD (P = 0.05)		23	12

Trials with pelargonic acid

Dow AgroSciences

Scythe®

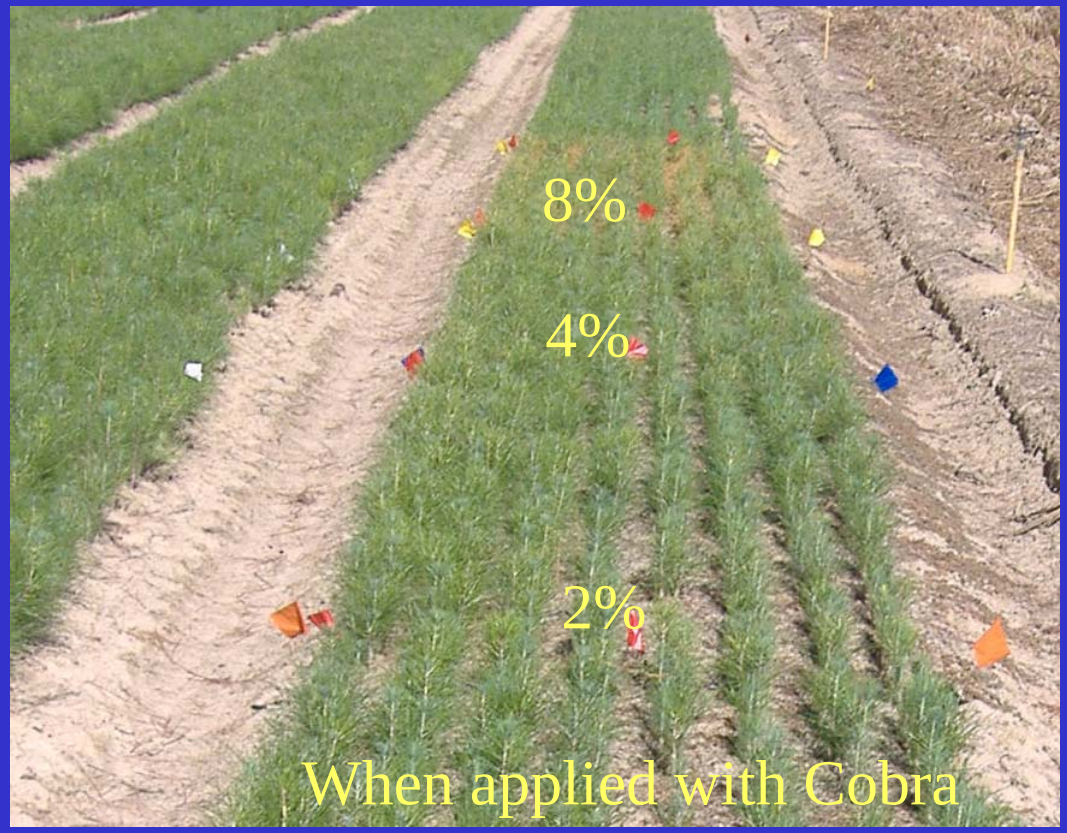
Herbicide

®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.



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

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

Trials with pelargonic acid

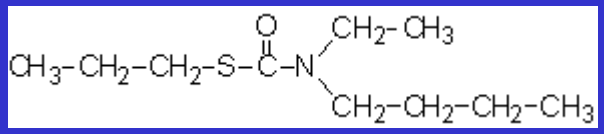
Non-Crop Use Sites and Use Methods

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

Rate Table

Desired Volume Of Spray Solution (gallons)	Amount of Scythe for Following Percent Solution (Volume/Volume)				
	1%	3%	5%	7%	10%
1	1-1/3 fl oz	4 fl oz	6-2/3 fl oz	9-1/3 fl oz	13 fl oz
2.5	3 1/4 fl oz	9 2/3 fl oz	1 pt	1 3/8 pt	2 pt
5	6-2/3 fl oz	1-1/4 pt	2 pt	1-1/2 qt	2 qt
7.5	9 2/3 fl oz	1 3/4 pt	1 1/2 qt	2 1/4 qt	3 qt
0	13 fl oz	2-1/2 pt	2 qt	2-3/4 qt	1 gal

1 Gallon = $50

4% = 1 Gallon per 24 gallons of water = $50/acre

4% = 0.5 Gallon per 12 gallons of water = $25/acre

Might also control some insects?

Table 1.

Treatment	amt formulation/100 gal	% mortality of white peach scales	
		7 DAT[a]	28 DAT[b]
Pyriproxyfen	10 fl oz	30.0a	43.3ab
Oil	1 gal	46.7ab	33.3ab
Pyriproxyfen + Oil	10 fl oz +1 gal	51.7ab	43.3ab
Pelargonic acid 1%	1 gal	35.4a	18.4a
Pelargonic acid 3%	3 gal	81.2bc	73.3bc
Pelargonic acid 5%	5 gal	100.0c	100.0c
Untreated check	---	35.0a	23.3a

Means in a column followed by different letters are significantly different by Tukey's multiple comparison procedure ($P \leq 0.05$).
[a, b] Significant by ANOVA; $P = 0.003$, $P < 0.0005$, respectively.

Preemergence herbicide toxicity

Possible treatments

imazapic
oryzalin
atrazine
sulfometuron

Questions?

Realized gains from planting large-diameter seedlings and intensive management

David South
Auburn University
James L. Rakestraw
George A. Lowerts
Union Camp Corporation (now International Paper)
Euan G. Mason
University of Canterbury

Does seedling quality play a role in increasing yields of pines?

Some say it played a role in the past but does not contribute to gains from intensive management.

Stanturf, J.A., Kellison, R.C., Broerman F.S. and Jones S.B. 2003. Productivity of southern pine plantations: where are we and how did we get here? Journal of Forestry 101(3):26-31.

Table 1. Estimates of productivity gained as management intensified in southern pine plantations.

	Second Forest (naturally regenerated)[1]	Third Forest (unimproved plantation)[2]	Fourth Forest (improved plantation)[3]	Fifth Forest (intensively managed plantation)[4]	Increase over base
Average productivity Green wt.	1 ton/acre/yr	3 tons/acre/yr	5 tons/acre/yr	8 tons/acre/yr	
	Percentage increase in productivity attributable to each factor				
Stocking control	None	40	0	0	11
Tree improvement	None	0	40	20	20
Nutrition	None	0	10	35	18
Vegetation management	None	0	5	35	16
Seedling quality	None	10	5	0	4
Biotechnology	None	0	0	0	0
Pest management	None	0	5	0	1
Soil-site classification	None	0	10	10	7
Site preparation	None	50	25	0	21
Intermediate treatments	None	0	0	0	0

[1] The naturally regenerated forest, beginning in the 1920s, followed exclusion of wildfire and grazing animals. We set this as our base, and estimated productivity averaged 1 ton/acre/yr. Tons per acre pine roundwood can be converted to cubic meters per hectare solid roundwood by multiplying by 2.09.
[2] Unimproved plantations beginning in the 1950s with aerial seeding, later some planting; typically, this was on old fields and burned areas, and conversion of understocked natural stands. The increase in productivity over the naturally regenerated forest was 2 tons/acre/yr.
[3] Improved plantations with increased productivity of 2 tons/acre/yr over unimproved plantations.
[4] Intensively managed plantations of today; productivity increased another 3 tons/acre/yr.

Journal of Forestry • April/May 2003

Seedling quality was important for 3rd and 4th forests but apparently no longer important for improving volume gains from 4th to 5th forests.

These practices are deemed important

- **Yield enhancement**

Fertilization	Irrigation
Density control	Pest control
Fire suppression	Herbivore control
Genetic improvement	Climate change

We wanted to test the hypothesis:
Seedling quality can contribute to yield enhancement when applying herbicides, fertilizers, insecticides and genetic improvement.

First year - Tattnall - Dec 1993

- Standard silviculture +
- Standard seedlings 5.5 mm RCD

- Standard silviculture +
- Morphologically improved seedlings 8.5 mm RCD

First year - Tattnall - Dec 1993

- Intensive silviculture +
- Standard seedlings

- Intensive silviculture +
- Morphologically improved seedlings

Standard

- Shear-rake-pile bed
- DAP at planting
- Velpar and Oust at planting

Intensive

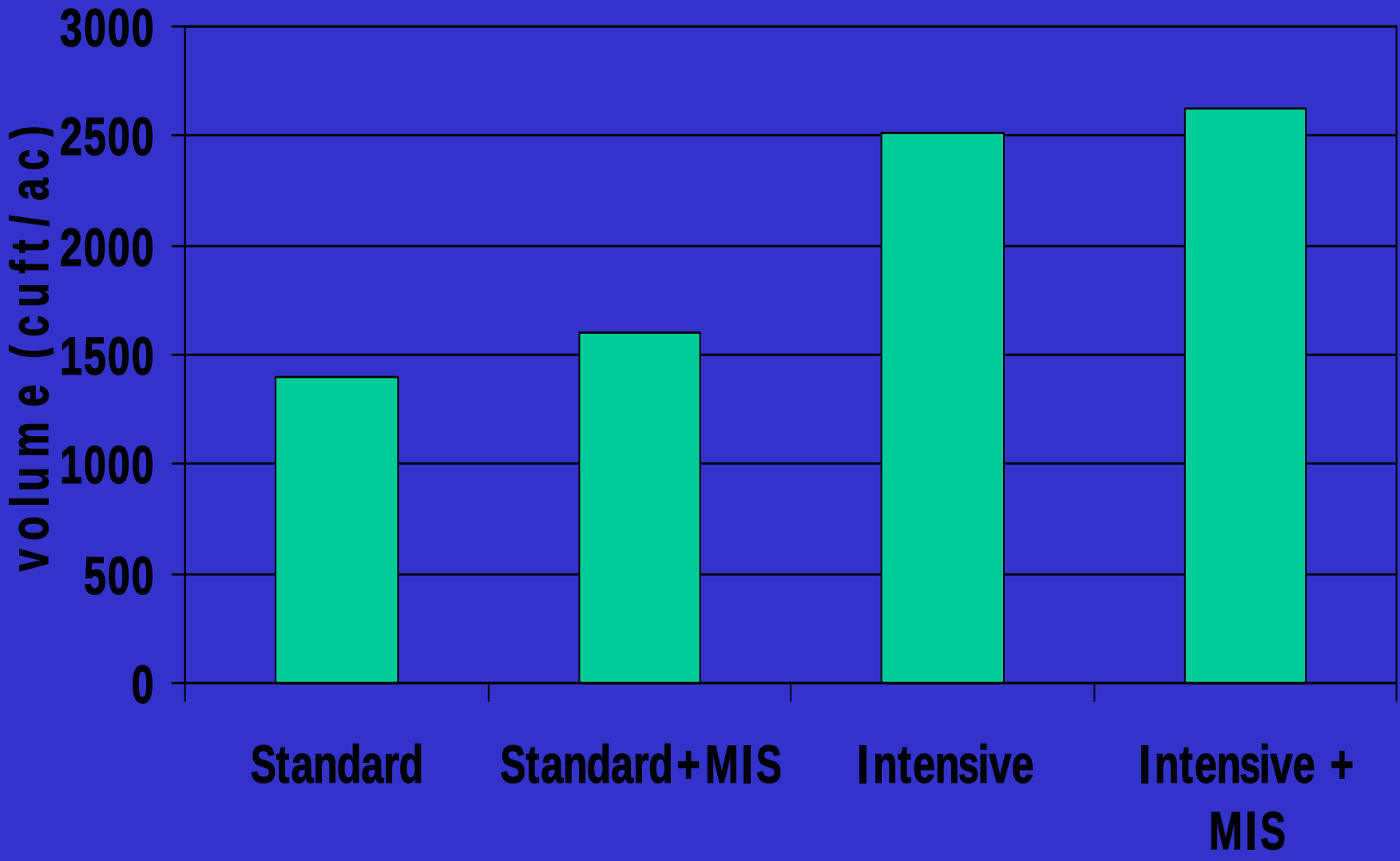
- Shear-rake-pile bed
- DAP at planting
- Velpar and Oust at planting
- 2 insecticide - yr 1
- Arsenal + Escort -yr 1
- Arsenal + Escort - yr 2
- 2 insecticide - yr 2
- KCl + DAP - yr 3

12 yr measurements

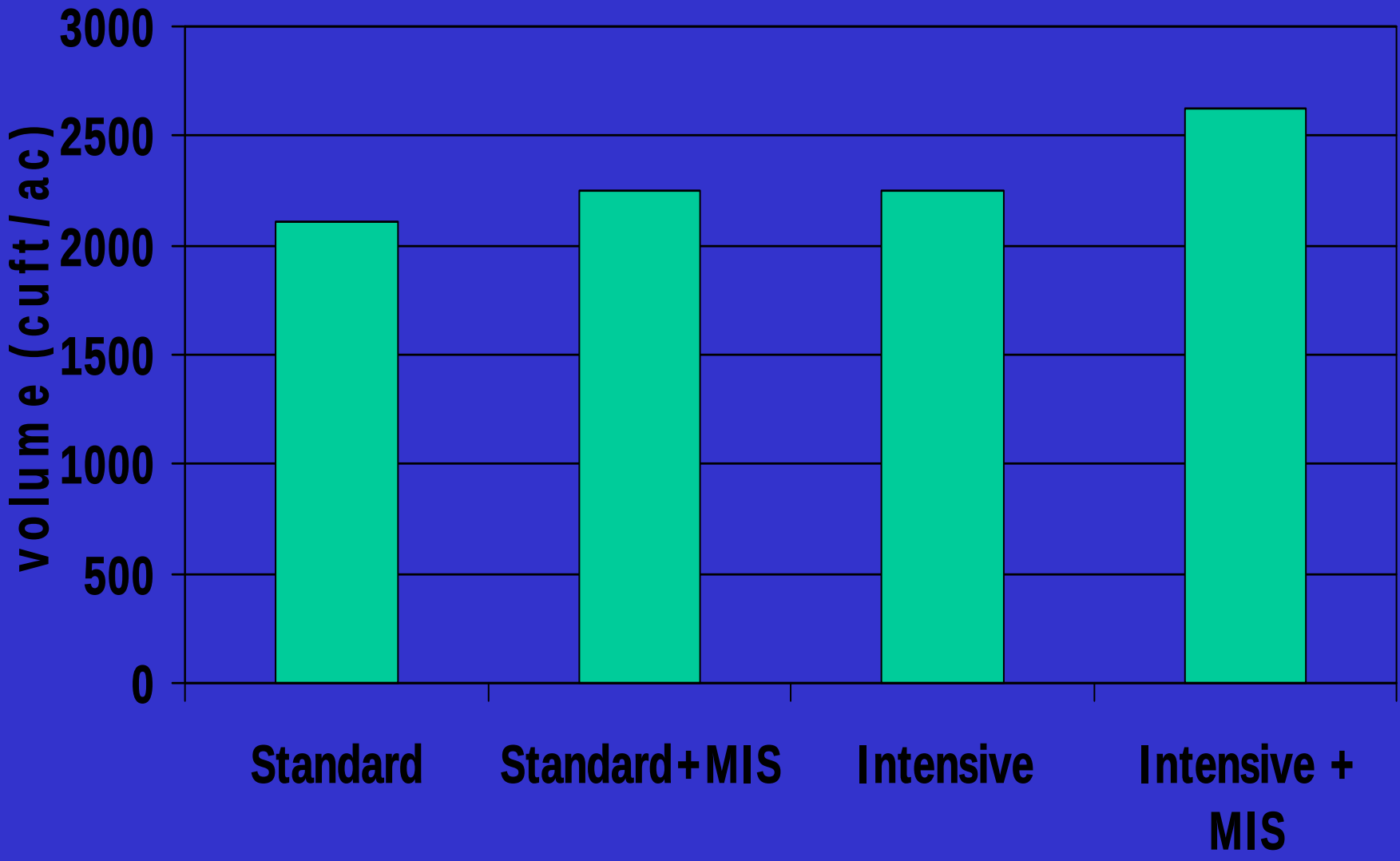
ANOVA

	P >F
Site	0.0047
Extra chemicals	0.0033
Seedling morphology	0.0174
Interaction	0.9364

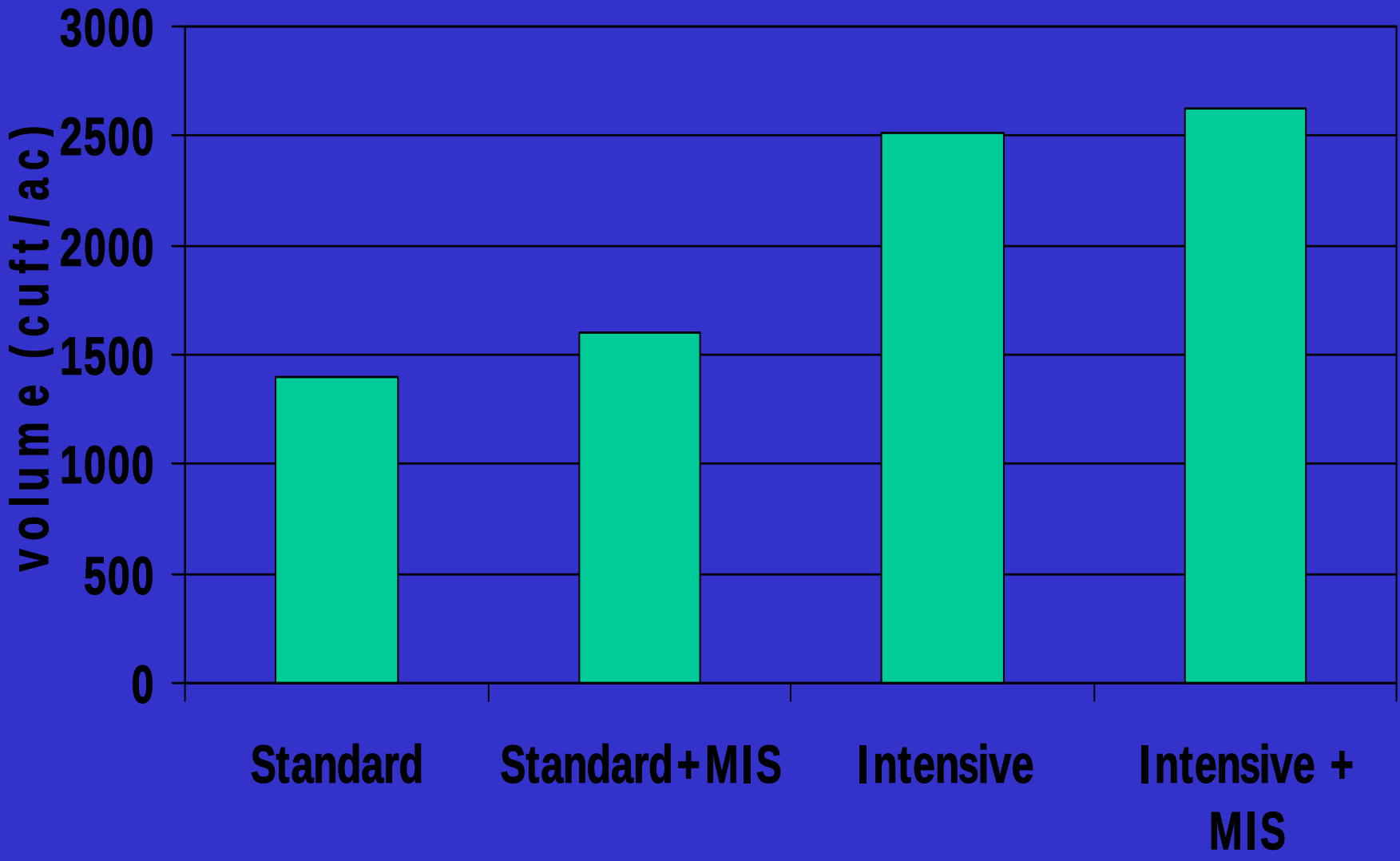
Tattnall – 12 YR



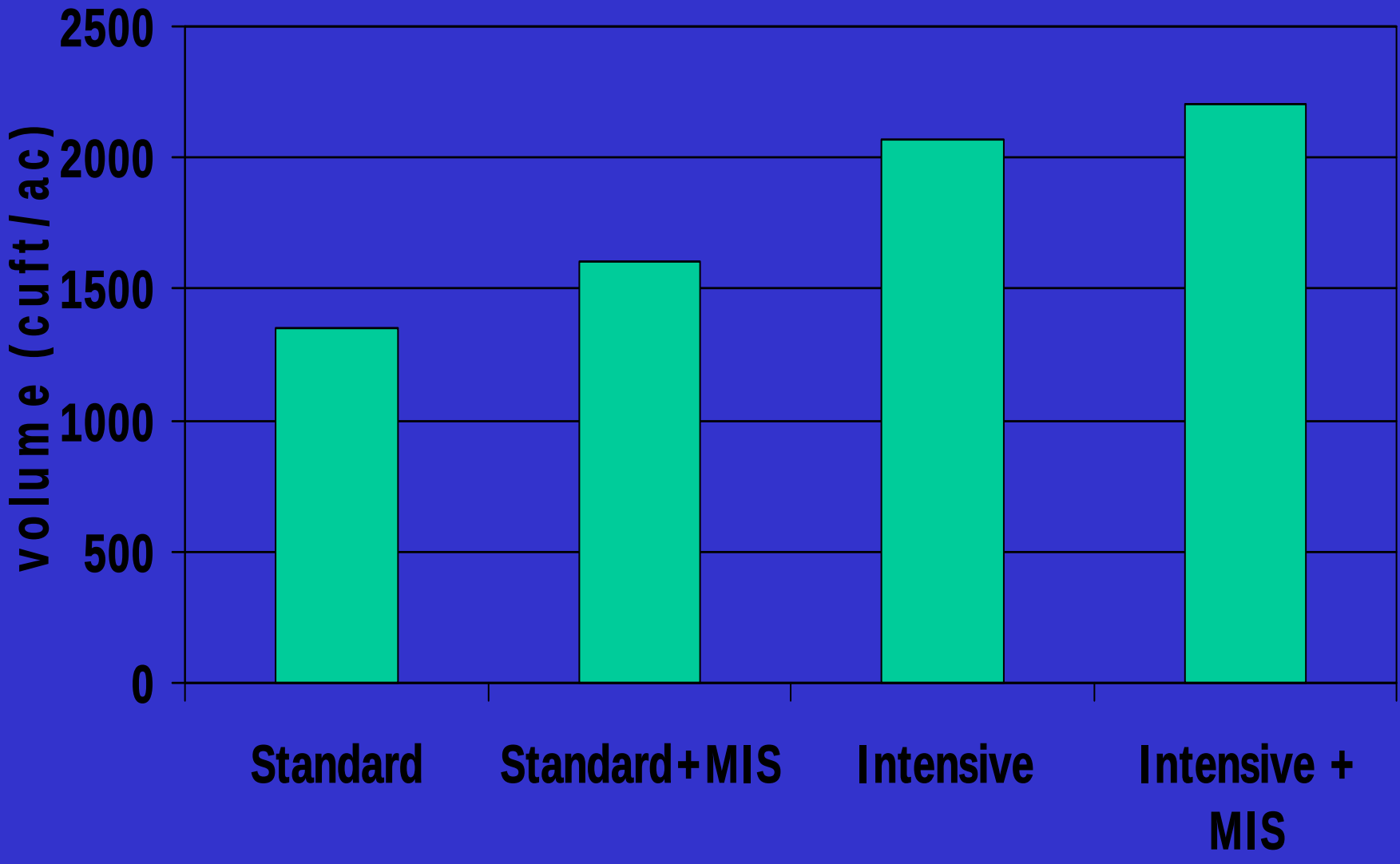
Hampton – 12 YR



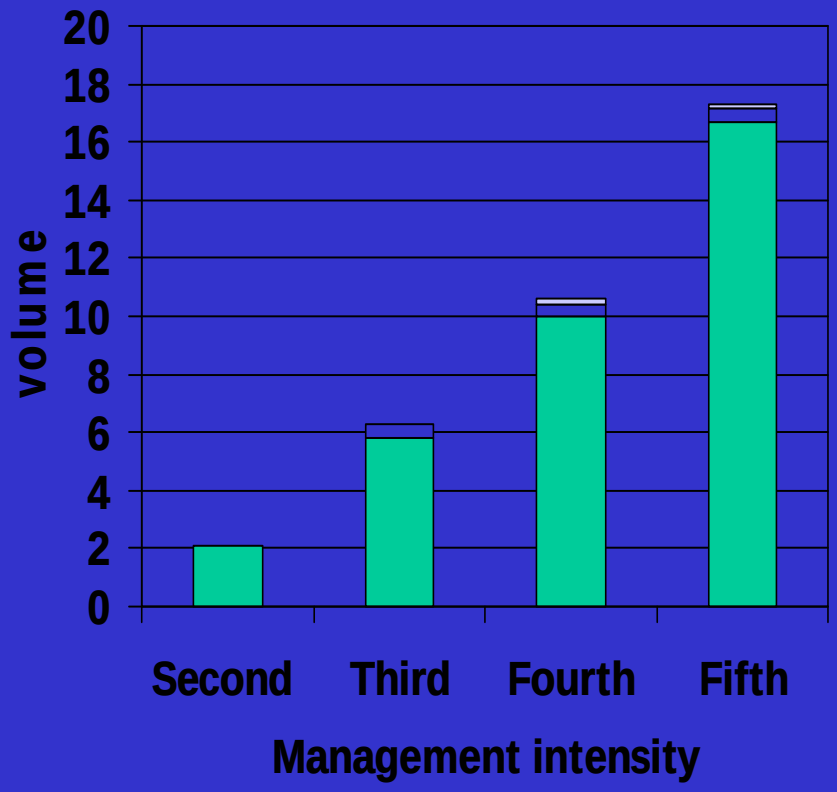
Effingham – 12 YR



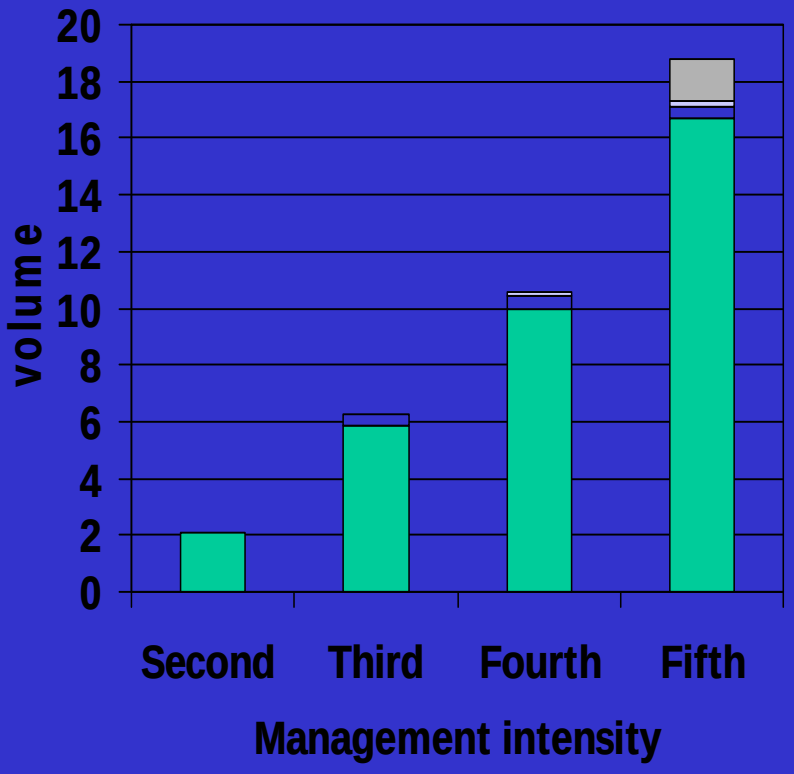
Long – 12 YR


2500
2000
1500
1000
500
0
volume (cuft/ac)
Standard
Standard+MIS
Intensive
Intensive + MIS

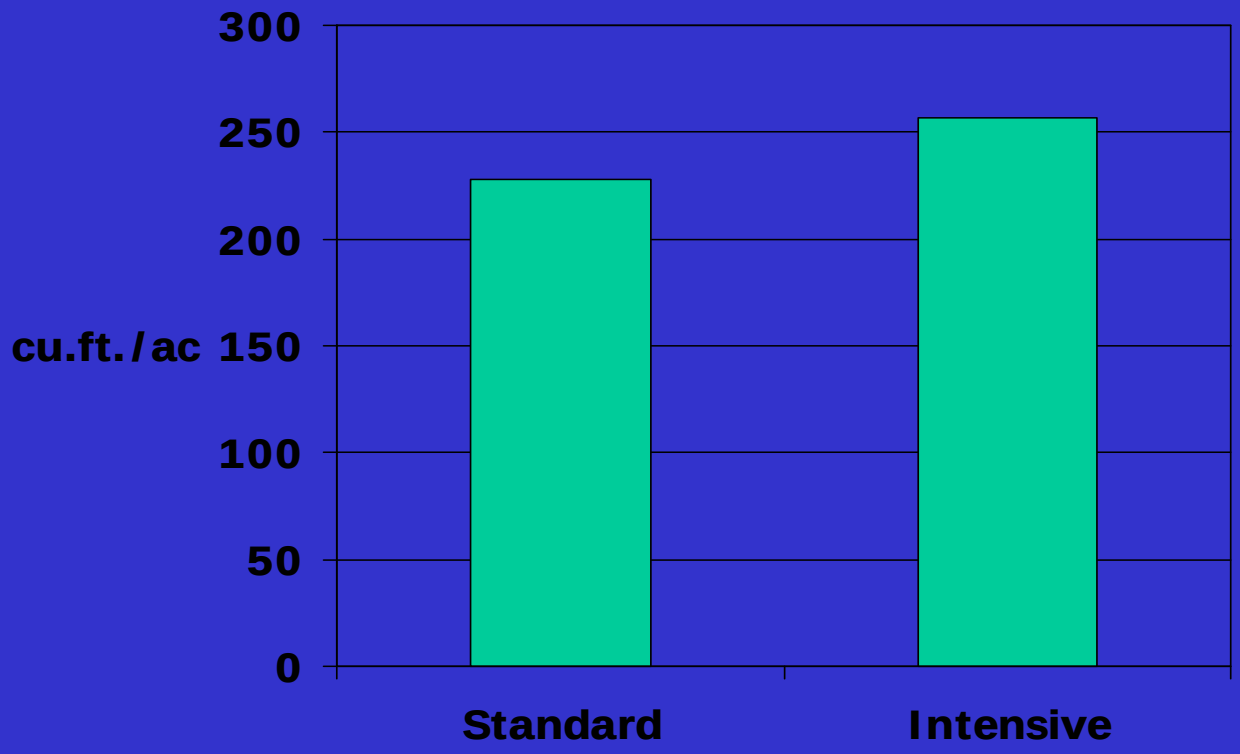
Stanturf et al 2003



South et al.



Average volume gains due to better seedling quality (age 12)



We are among the few who accept the hypothesis: Seedling quality can contribute to yield enhancement when applying herbicides, fertilizers, insecticides and genetic improvement.

QUESTIONS?