Weed Control

David South
Auburn University

Handweeding at the Stuart Nursery near Pollock, Louisiana

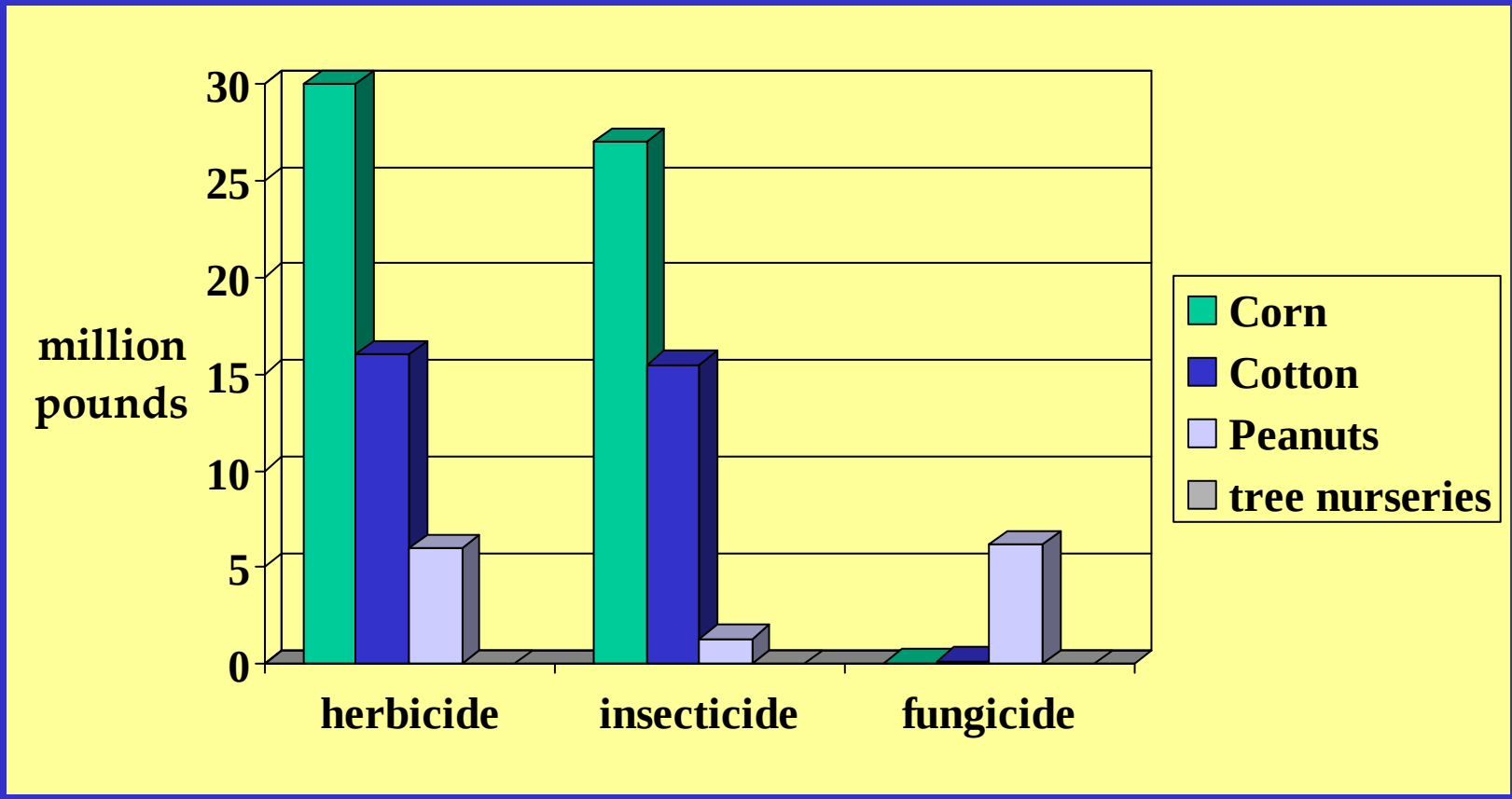
Photo taken by M.A. Huberman October 1935. Credit Line: U.S. Forest Service. (photo #310266)

High value : Ultra-minor crop

- 1 acre of loblolly pine nursery is worth about $30,000.
- 2,000 crop acres would be enough land to produce 1.277 billion loblolly pine seedlings

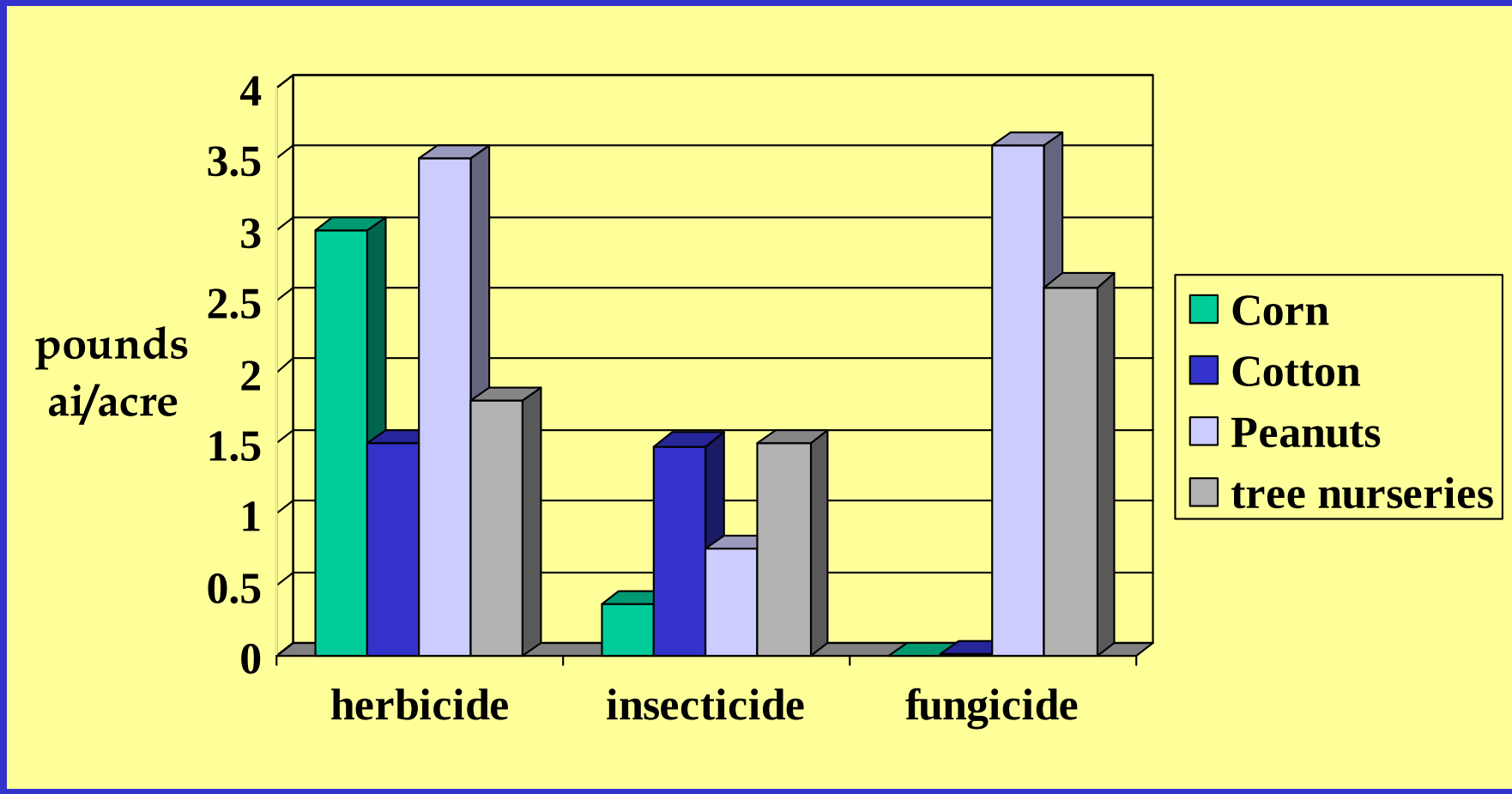
Pesticide use 1989-92

219

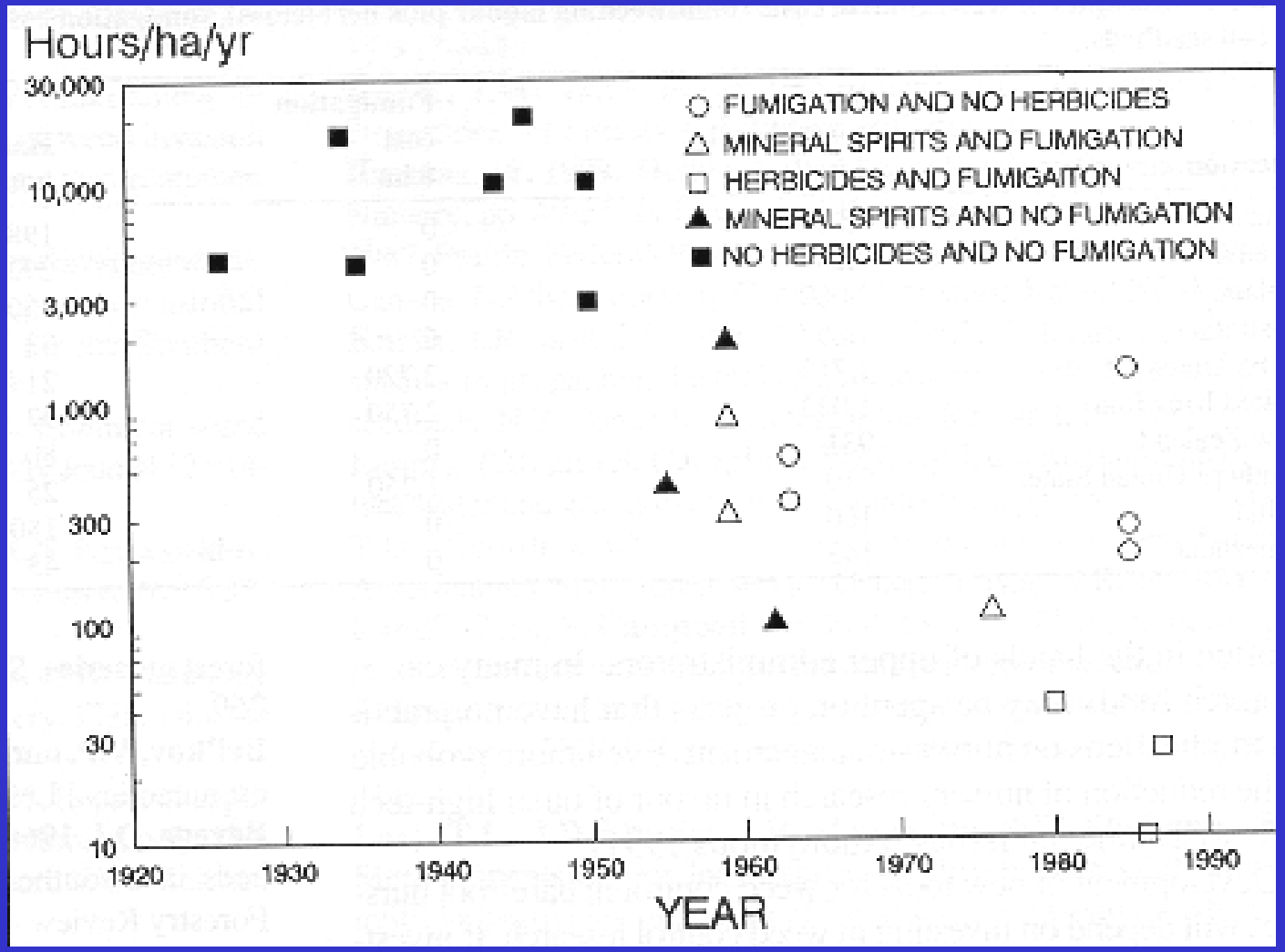


7,300 6,000 10,300 lbs tree nurseries

Pesticide use 1989-92



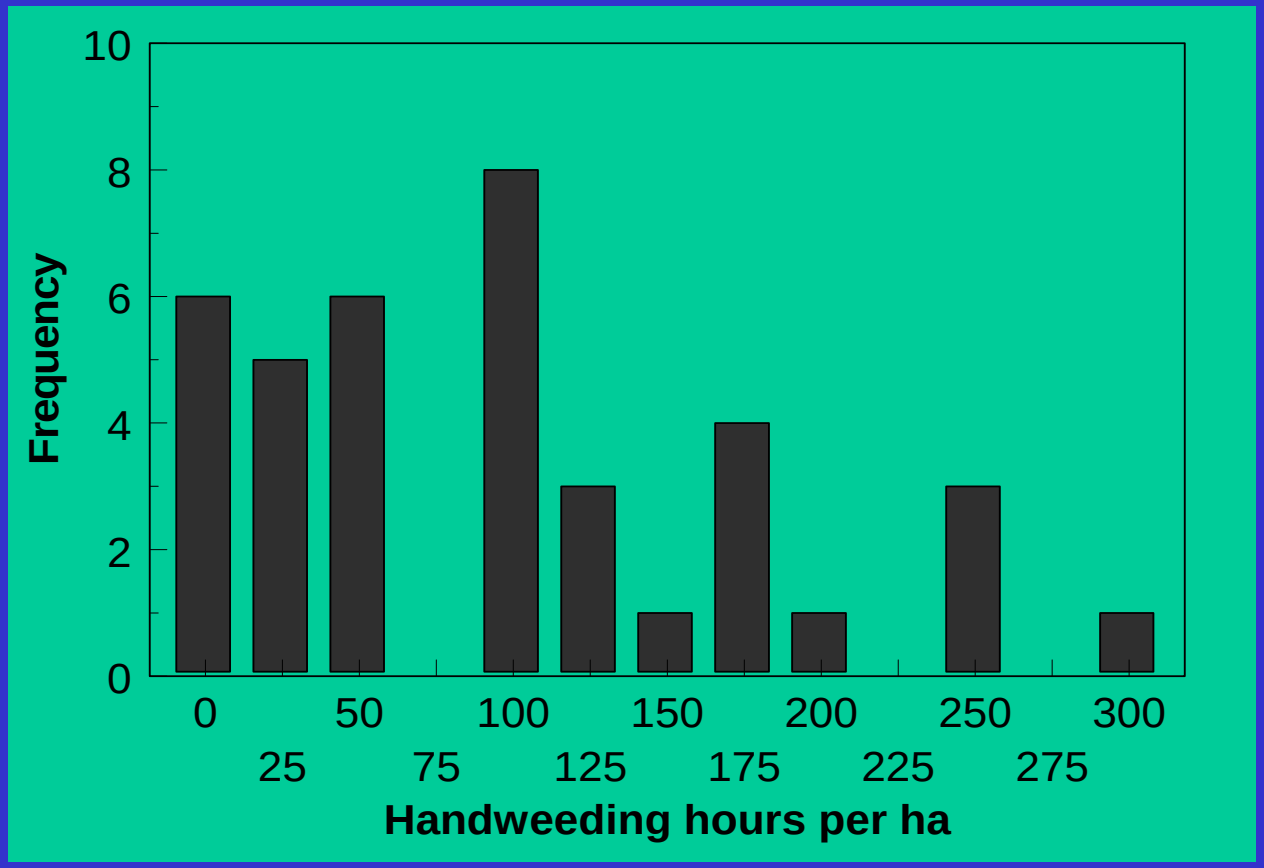
Handweeding times in forest tree nurseries.



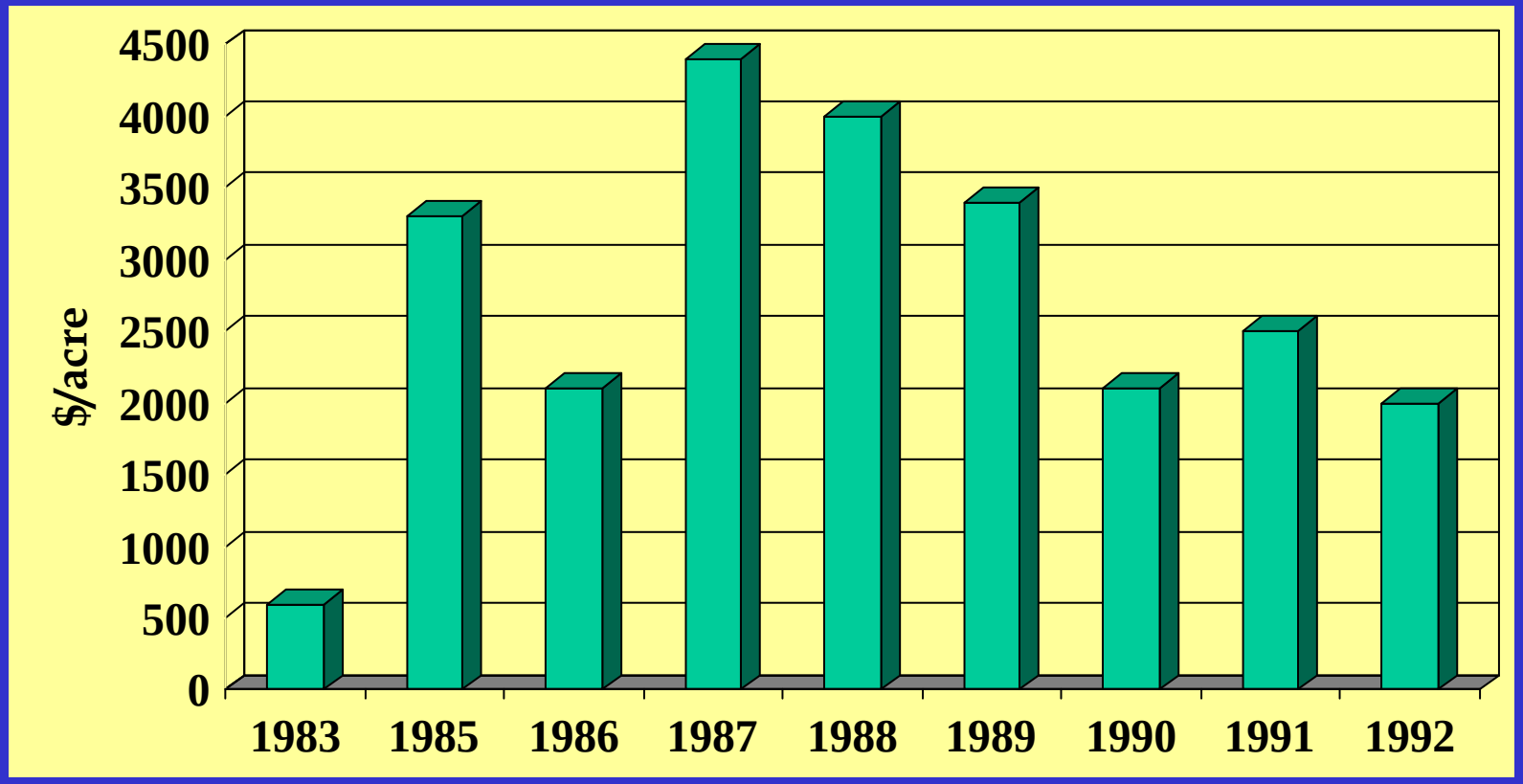
Handweeding in 2000

- AL- 2 hours/pine acre
- NC, GA, VA- 3
- AR- 5
- GA- 11
- TX- 24
- SC- 6-87
- Hardwoods up to 120 hours per acre

Handweeding hardwoods in 2006



Weed Control Costs – J.H. Stone Nursery



No herbicide - 1985-1992

Nursery Weed types

- Grasses
  - Annual
  - Perennial
- Broadleaves
  - Annual
  - Perennial
- Sedges
  - Annual
  - Perennial

http://www.csdl.tamu.edu/FLORA/gallery1.htm

Perennial grasses: Bermudagrass

Perennial grasses: cogongrass

Annual grasses: large crabgrass

Perennial sedges: Yellow nutsedge

1 tuber = 140 shoots in 6 months
All within 8 inches

Perennial sedges: chufa *Cyperus esculentus* var. *sativus*

CHUFA

GLENDALE ENTERPRISES, INC.

Chufas

Home | Up | What Are They | Horchata de Chufa | Not Michigan | Harvesting Chufas

Up
Next

Information

- The "What Are They" page.
- The "How To Grow" page.
- The "Horchata de Chufa" page.

Chufas shown in root turf

Perennial sedges: Purple nutsedge

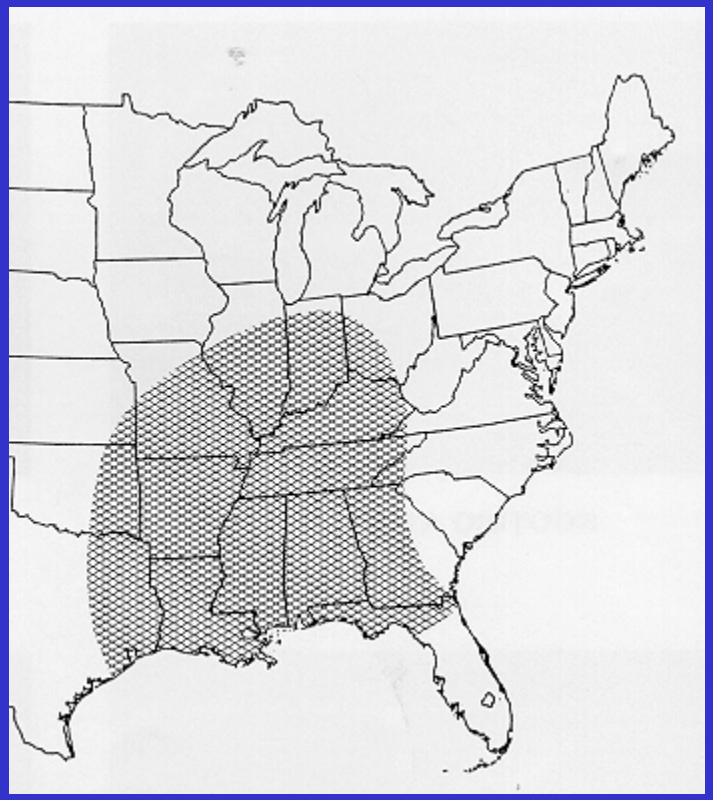
1 tuber = 280 shoots in 6 months

All within 10 feet

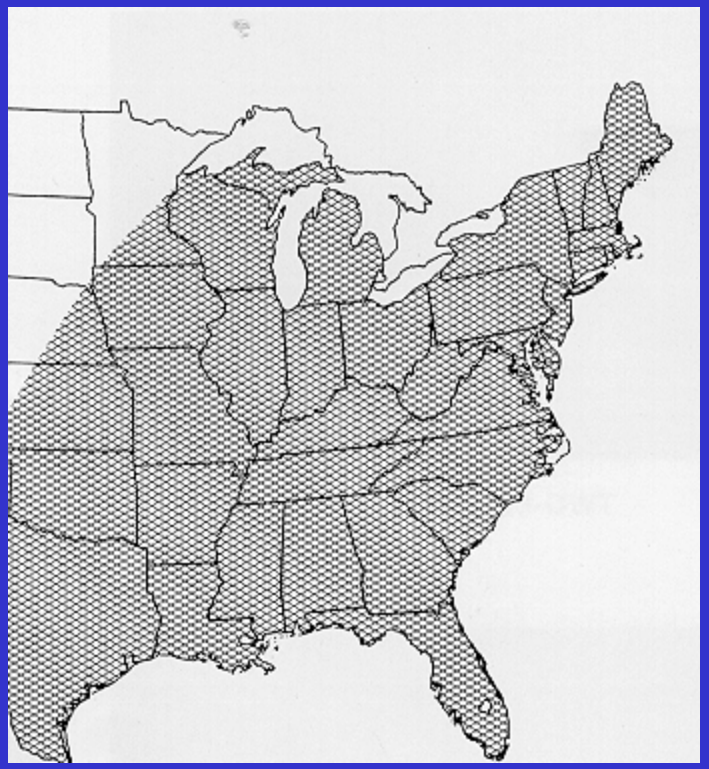
Annual sedges: Flathead sedge

Annual broadleaf: Prostrate spurge

Prostrate spurge



Spotted spurge



Prostrate spurge

FLOWER

YOUNG SEEDLINGS

ROOTING AT NODE

TWO-LEAF SEEDLING

Spotted spurge

FLOWER

TWO-LEAF SEEDLING

Annual broadleaf: Purslane

Annual broadleaf: Sicklepod

Annual broadleaf: Coffee senna

Annual broadleaf: Morningglory

Perennial broadleaf: knawel

Perennial broadleaf: white Clover

Equipment

- Boom sprayers
- Directed applicators – tractor
- Directed applicators – hand
- Fertilizer spreaders
- Fertigation

Equipment

Equipment

Weed wiper $3,900 -6 foot

cottonwood easy to control with glyphosate

www.weedproblems.com

http://smuckermfg.net


313

Tank Mixing Nutrients with Herbicides


Global fertilizer prices, 2000-2007
US $/mt
800
700
600
500
400
300
200
100
0
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
DAP, U.S. Gulf
MOP, Vancouver
Urea, Arab Gulf, prilled

High fertilizer cost

- The price of nitrogen fertilizers is directly related to the price of natural gas (methane). Manufacturing 1 ton of anhydrous ammonia fertilizer requires 33,500 cubic feet of natural gas. This cost represents most of the costs associated with manufacturing anhydrous ammonia. When natural gas prices are $2.50 per thousand cubic feet, the natural gas used to manufacture 1 ton of anhydrous ammonia fertilizer costs $83.75. If the price rises to $7.00 per thousand cubic feet of natural gas, the cost of natural gas used in manufacturing that ton of anhydrous ammonia rises to $234.50.

Cost per ton of nitrogen fertilizers

Anhydrus ammonia	$815
Ammonium sulfate	$400
Urea	$560
UAN-liquid	$425
Slow-release	$3,300

http://www.crystalsugar.com/agronomy/agtools/npk/index.asp

Cost in Cents per thousand of nitrogen fertilizers 2008

	Nitrogen per acre	
Type	150 lbs	300 lbs
Anhydrus A.	12.4	24.8
Urea	15.2	30.4
UAN-liquid	19.0	38.0
A. sulfate	23.8	47.6
Slow-release	217.0	434.0

E-mail questionnaire (28 nurseries)

- 5-GA, 4-AL, 4- SC, 3-LA, 3-TX, 3-VA, 2-MS, 2-NC, 1-AR, 1-FL

- 7 use only granular
- 21 use liquid (with some granular pre-plant)
- 2 inject into irrigation system

Liquid fertilizers can be applied throughout the day (even when it is raining).

With the right equipment, a nursery (50 acres) can be fertilized in just 4 hours.

In Virginia we use liquid fertilizers at all three nurseries. At GGFC and NKFC the fertilizers are tank mixed with the weekly Goal application. A custom blend is used that includes Uan, liquid KCL and sulfur (Ammonium thiosulfate). By doing this we do not make any extra trips through the fields to apply fertilizers except for minor nutrient applications which we could also probably do in the tank mix. Chuck Davey usually recommends one or two summer applications of KCL at higher rates. Applying this with the weekly applications eliminates the extra trip(s) and is far better at keeping adequate levels available for the seedlings. We always irrigate after these applications.

Just an observation, but we rarely, never is probably more accurate, have any significant yellowing of our seedlings in the heat of summer. We have not applied iron since we started using this tank mix in the eighties. I am not sure but I think the sulfur could be important in this matter. I added sulfur to our mix after observing better "greening" of seedlings that had Ammonium sulfate applied and reading that sulfur is important in nitrogen utilization by plants. I wonder if the sulfur doesn't have some additional effect besides nitrogen utilization.

As you and I have discussed, I also believe our weed control is better with our tank mix.

At Augusta Forestry Center we use Uan and liquid Ammonium Sulfate (mostly on the pines) on both pines and hardwoods with good success.

Adding ammonium to herbicides like Goal, Reflex and Cobra increases the phytotoxicity to weeds. Farmers often add ammonium nitrate to herbicides to act as an adjuvant.
The ammonium ion also can increase the “burn” on newly formed needles. To reduce injury, many managers apply irrigation soon after applying the tank-mix.

Not all herbicides respond this way.

Irrigate after application

Garland Gray Nursery - VA

	Goal fertilizer tank-mix	Lbs N/acre
• June 15	10-1-14 (+2.5% S)	20
• June 22	10-1-14 (+2.5% S)	20
• June 29	10-1-14 (+2.5% S)	20
• July 6	10-1-14 (+2.5% S)	20
• July 13	10-0-8 (+4% S)	35
• July 20	10-0-8 (+4% S)	35
• July 27	10-0-8 (+4% S)	35
• Aug 3	10-0-8 (+4% S)	35
• Aug 10	10-0-8 (+4% S)	35
• Aug 17	10-0-8 (+4% S)	35

290 Lbs N/acre tota

UAN (50% Urea and 50% Ammonium Nitrate)

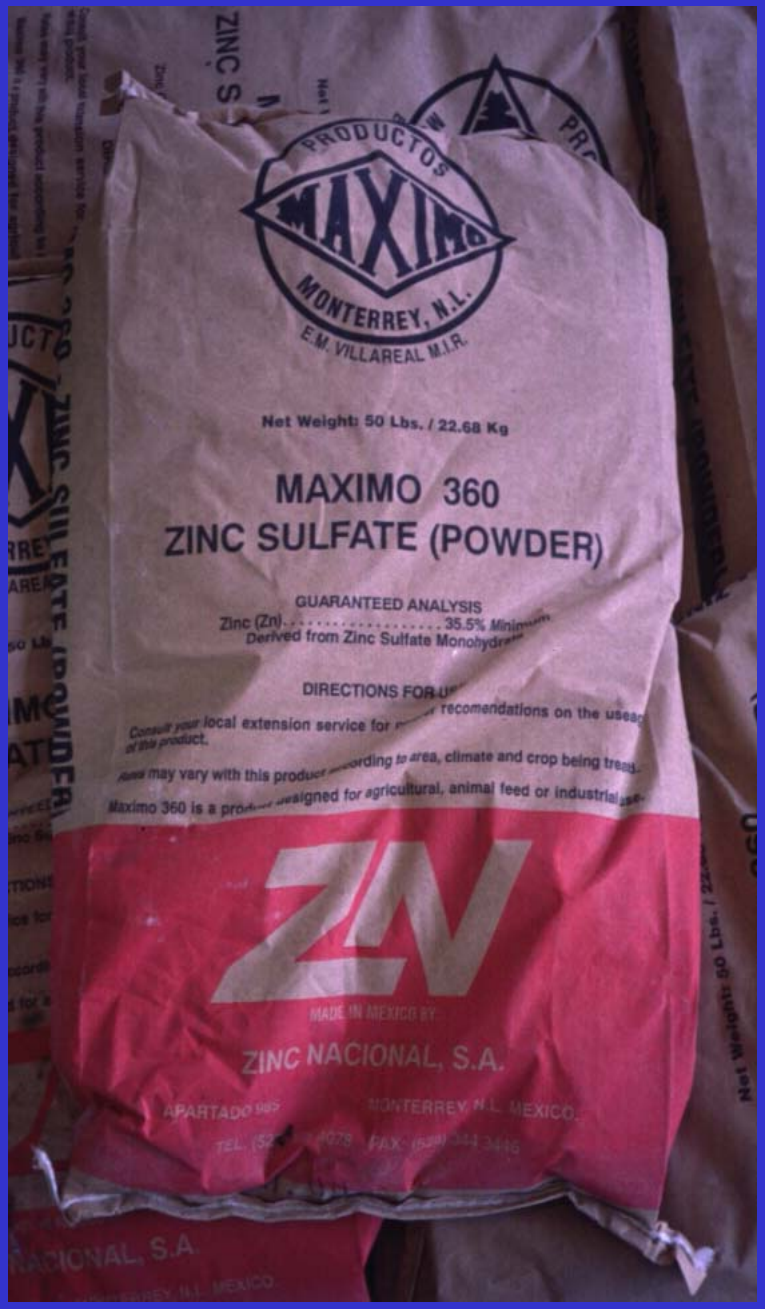
To use UAN on farms (transportation, storing, spreading) is about 30 % cheaper than to use ammonium nitrate. Urea ammonium nitrate solution can be spread in combination with plant protection products, it is easily miscible with other liquid fertilizers. This fertilizer contains no admixtures harmful for plants. UAN fertilizers have more advantages against solid nitric fertilizers:

· you can absolutely mechanize transportation, loading, unloading and storage process,
· storage is easy and cheap,
· you can spray fertilizer on the ground evenly in small quantities,
· UAN meets better local and additive fertilizing requirements,
· UAN is suitable for composing mixtures with various pesticides

http://www.achema.com/eng_p03.htm

Urea + 3%S + 6% Fe

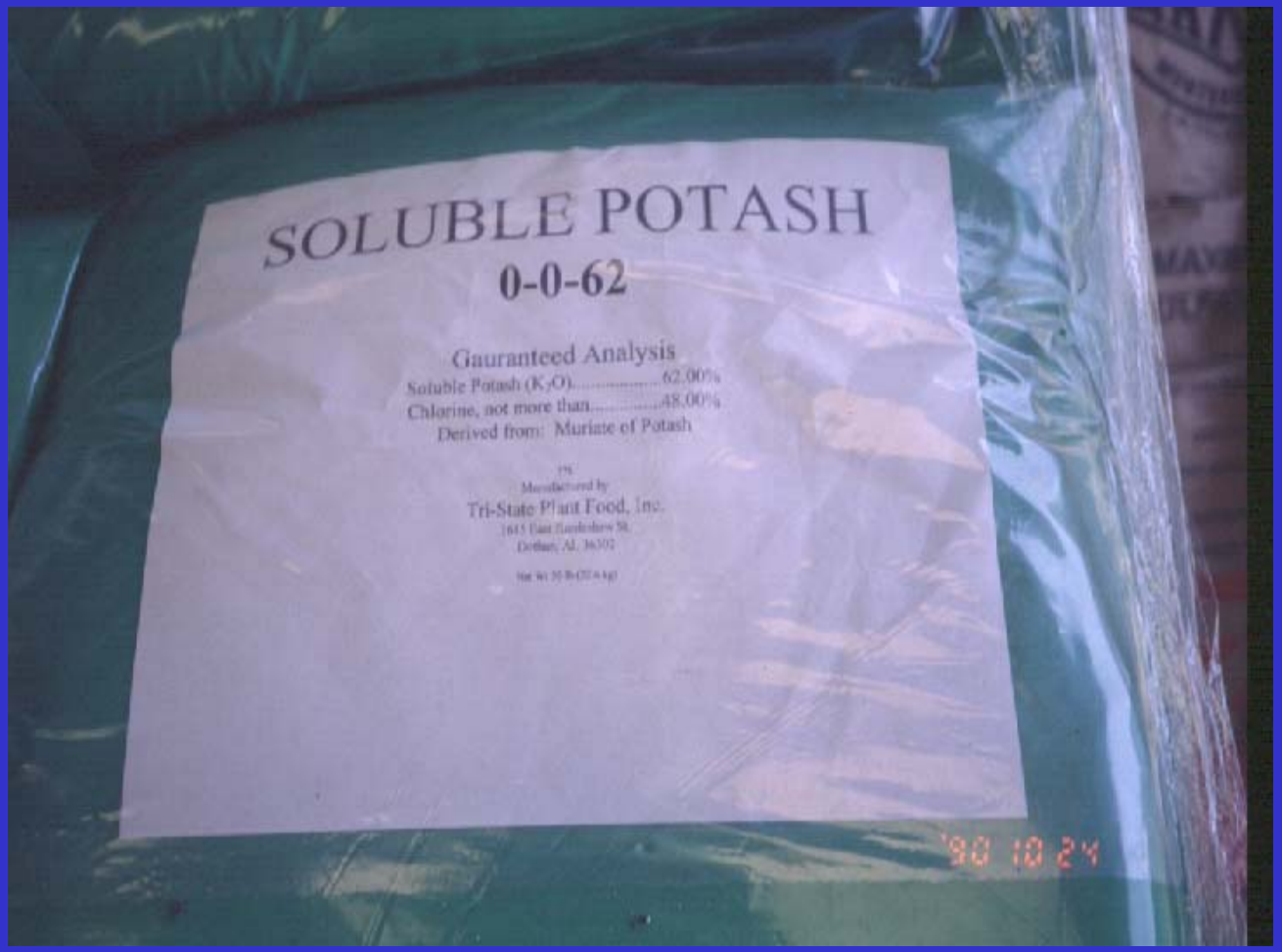
15-0-0



Zinc sulfate

35% zinc

SOLUBLE POTASH 0-0-62



Ammonium phosphate

10-34-0

N (32-0-0) UAN

50% Urea and 50% Ammonium Nitrate

N (15-0-0)

15% urea, 3% S and 6% Fe (Six Iron)

P (10-34-0) Ammonium phosphate

K (0-0-62) Potassium chloride

(62% white - fine standard grade)

The Mississippi Potash East facility produces a 62 percent white product that is supplied to agricultural and industrial markets. These products include a standard and a fine standard grade that is used as a source of potassium for liquid fertilizer mixes.

Predictions for the Future

Due to economics, ease of application, uniformity of application, 9-bed sprayers, ability to tank-mix with herbicides, the ability to control nutrient release, and homeland security,
the use of liquid fertilizers will increase.