

2007

Research Update Meeting 2007 - Weed Management Update 2007

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Recommended Citation

Sandler, Hilary A., "Research Update Meeting 2007 - Weed Management Update 2007" (2007). *Cranberry Station Extension meetings*. 59.

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Weed Management Update 2007

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IPM / Weed Specialist

Research
Assistants
2006

Katherine Ghantous
Krystal Demoranville
Nancy DePaulo
Seasons Suders
Mike Walsh
James O'Connell

Topics

- ▶ Dodder germination
- ▶ Herbicide trials
- ▶ Sand stock piles as seedbanks
- ▶ Web site

**Germination Patterns of
Dodder Seeds in
Southeastern MA:
1998 - 2006**

Dodder (*Cuscuta gronovii*)

- Obligate parasite
- Widespread
- Causes severe yield losses





Flowers

Dodder strands

Dodder Control

- ▶ Kerb
- ▶ Casoron
- ▶ Short floods
- ▶ Hand picking
- ▶ Uniform sand application



Purpose of Study

- ▶ Improve efficacy of control with better timing.
- ▶ Not much known about MA dodder germination patterns.
 - Patterns of 1st germination ?
 - Peak germination ?
 - Survival of seed ?

Materials and Methods

- ▶ Fall 1997: inoculated with 150 cc unscarified seed.
- ▶ Fall 1998: inoculated with 15 cc unscarified seed.
- ▶ Exposed to natural weather conditions.

Inoculation Amounts

Study 1
150 cc



~ 65,000 seeds

1999
15 cc



~ 6,500 seeds



Materials and Methods

- ▶ Starting early April, looked for 1st germination.
- ▶ Once seen, ck'd as needed.
 - # seedlings per container
 - Removed after counted
- ▶ No additional seed added over course of study.



1 – 2 days old
Just germinated

Several days old



Materials and Methods

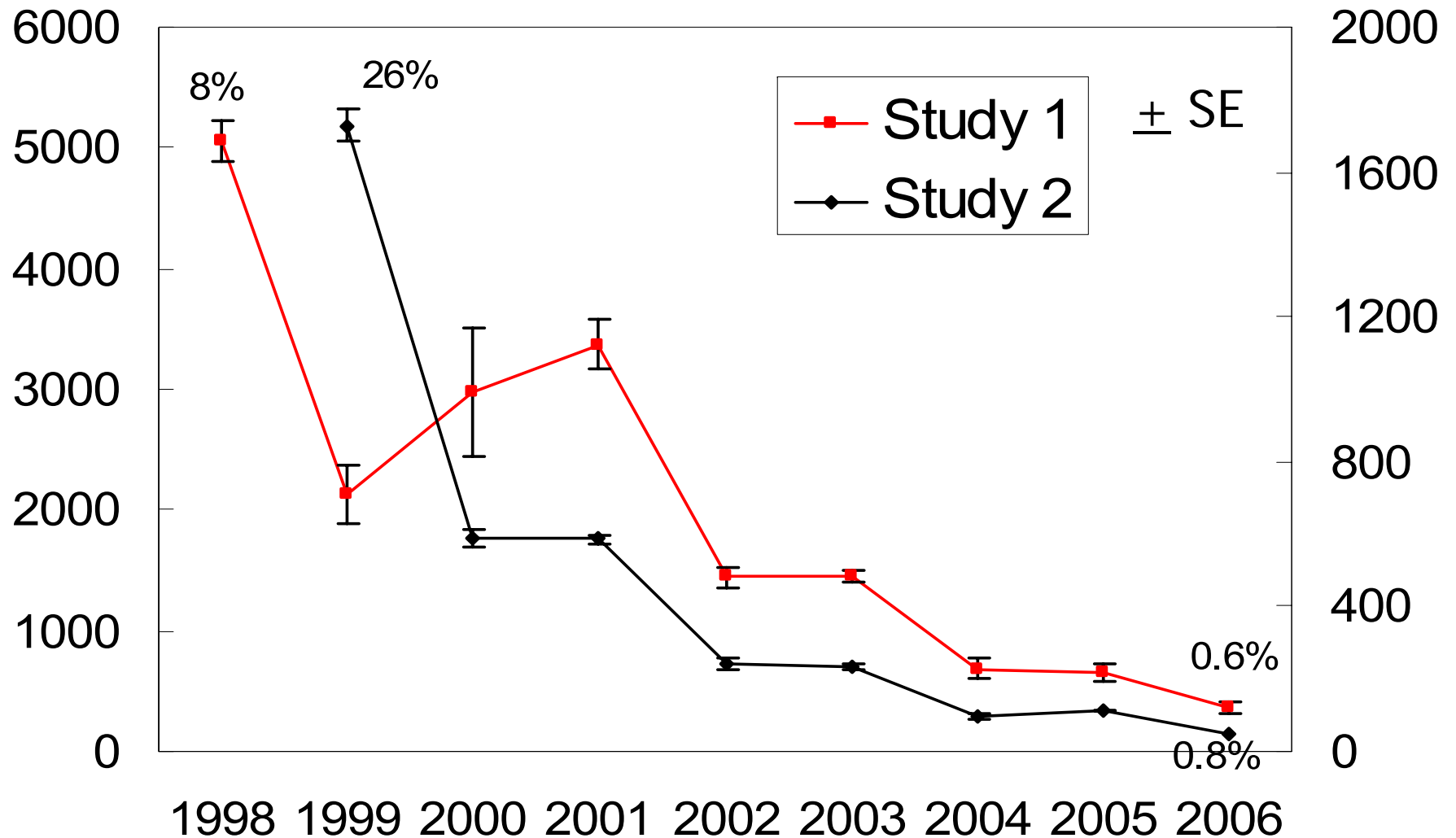
► Collected temperatures

- Max / Min air T
- GDD: using 3 C (38 F) as base T.

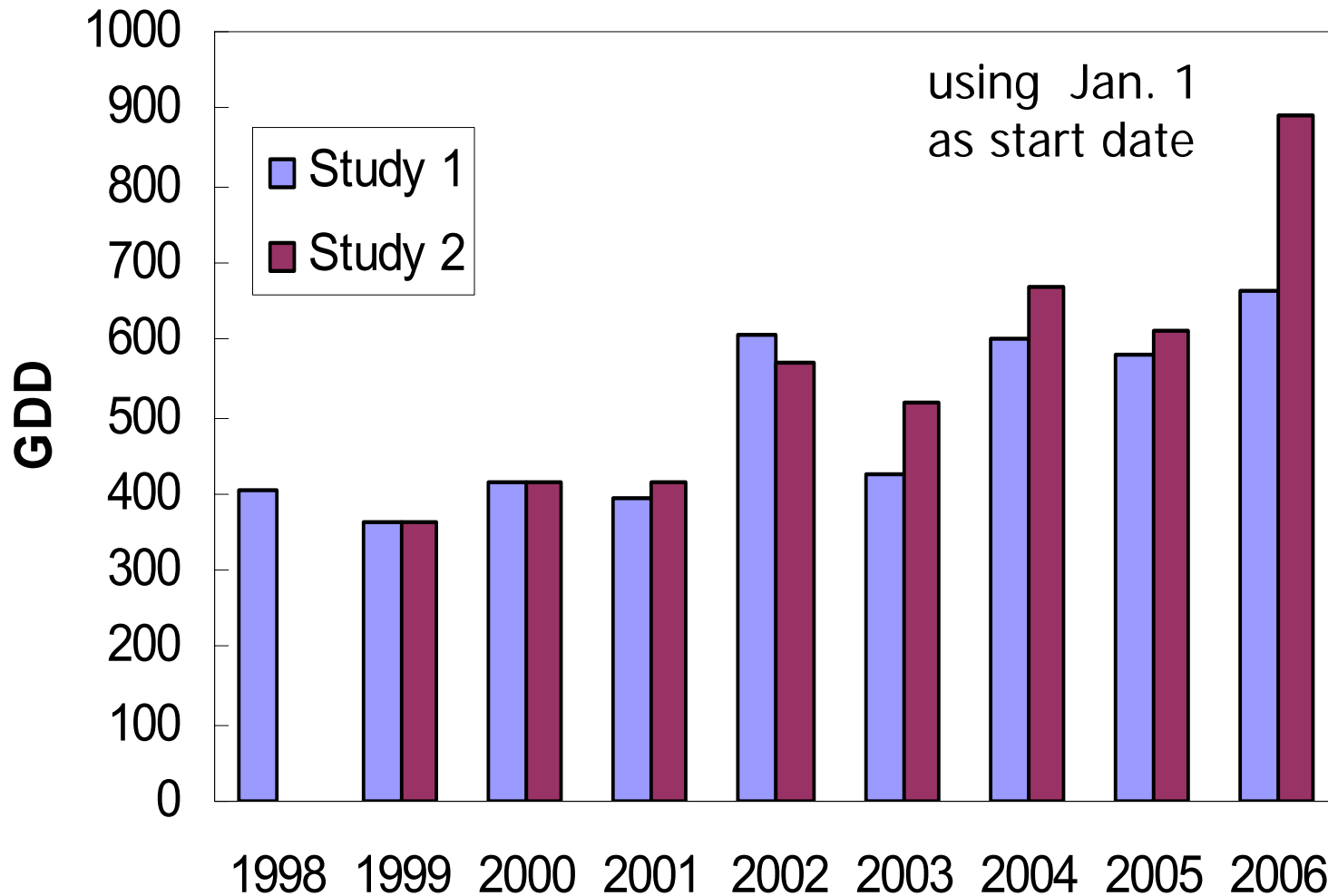
Mean # Germinations / Container

Study 1

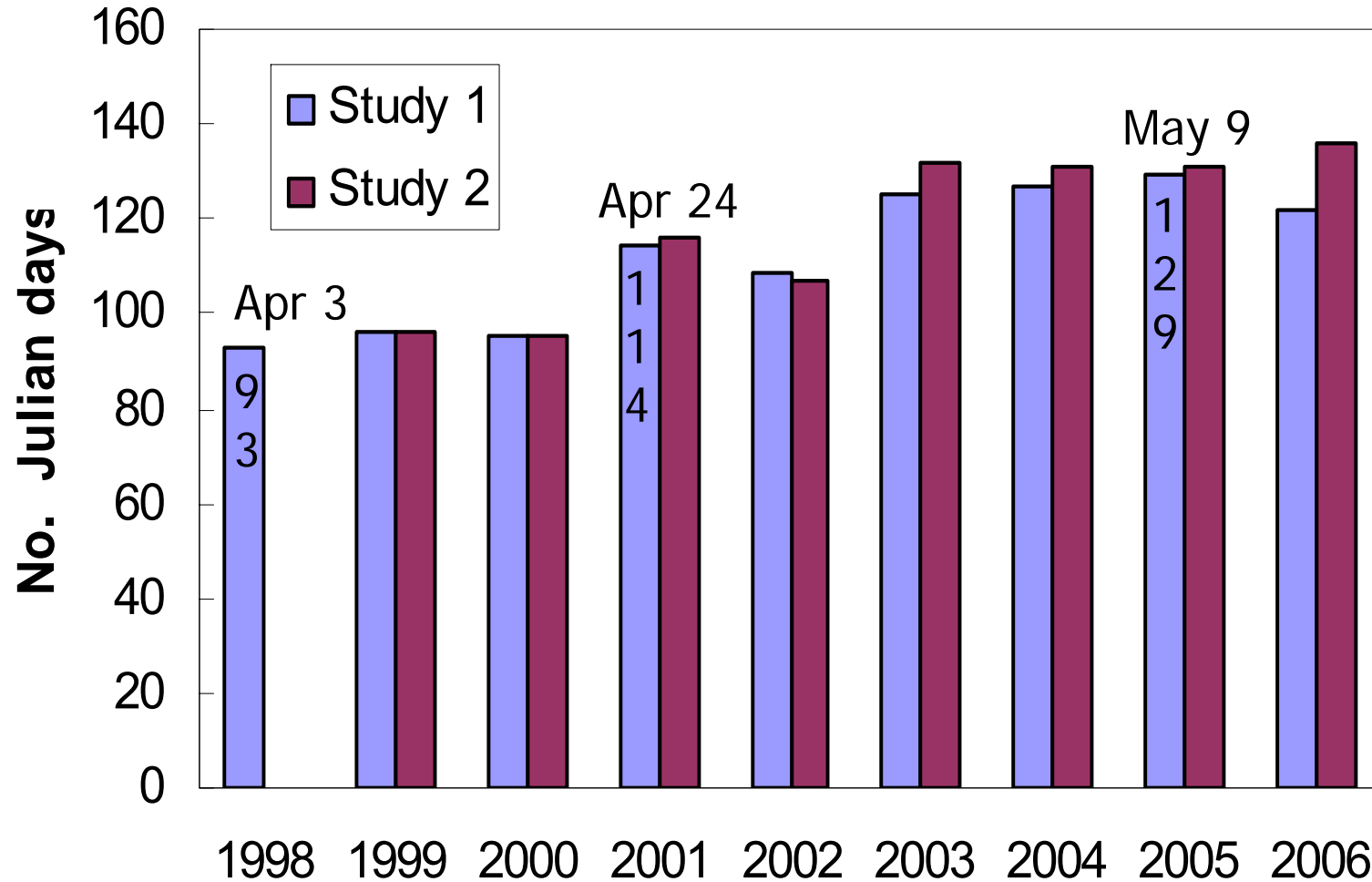
Study 2



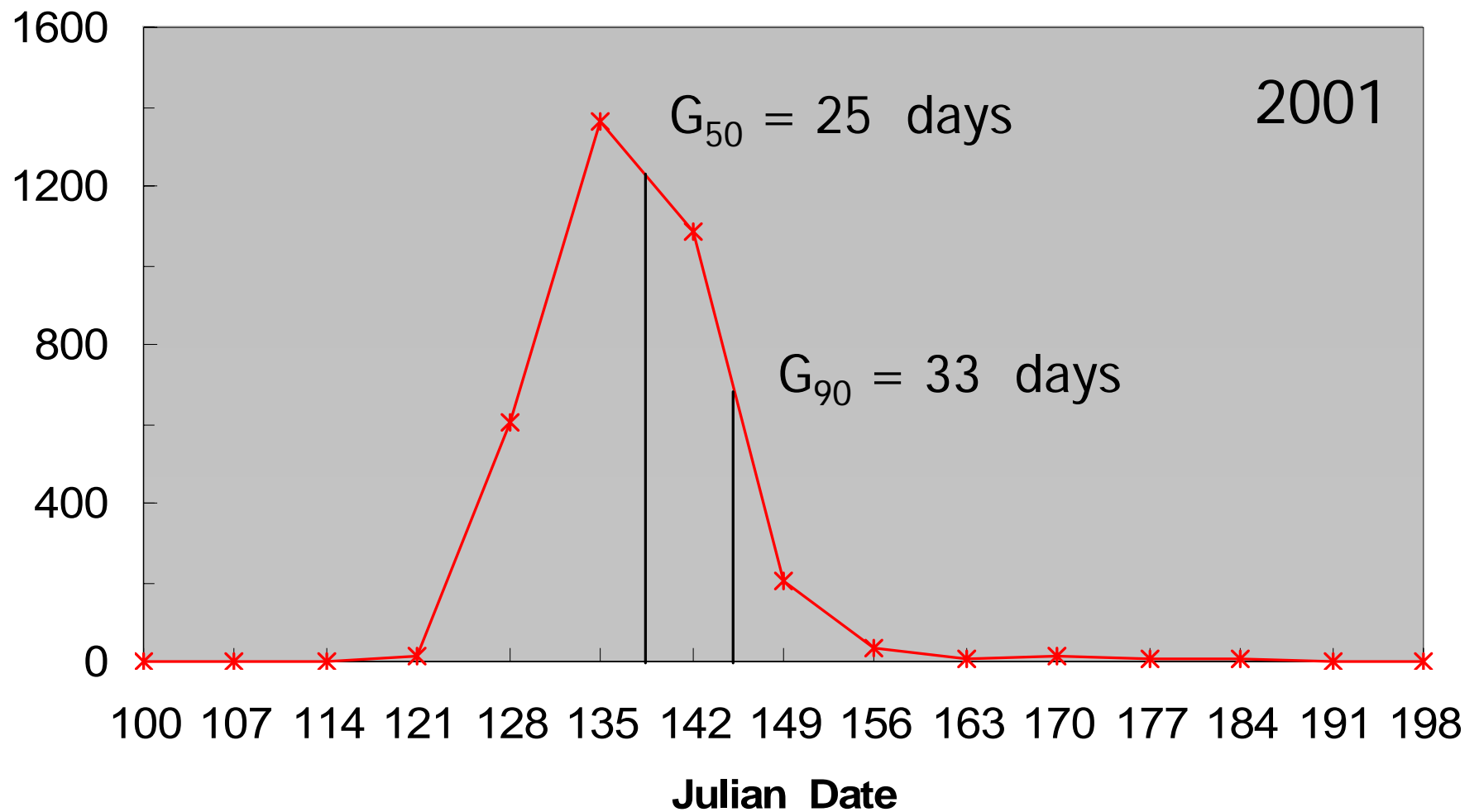
GDD to First Germination



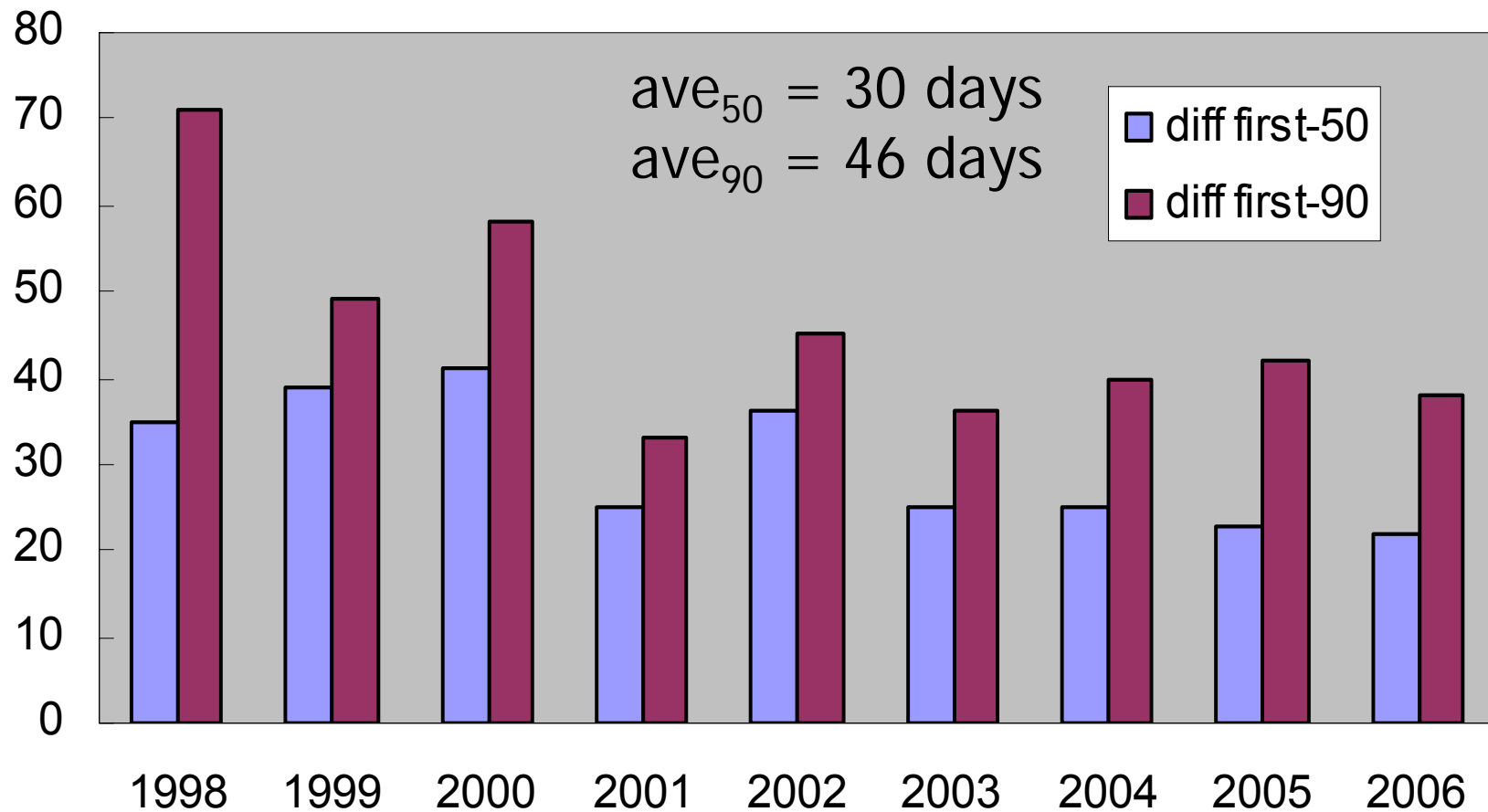
Date of First Germination



Elapsed Days from 1st Germination



Elapsed Days from 1st Germination



Current Management

- ▶ Look for seedlings.
- ▶ Apply Casoron late April & Kerb mid-May.
- ▶ Apply Kerb mid-May.
- ▶ Apply Kerb mid-May & early June.
- ▶ Flood mid-May.

SO ??

- ▶ Seedbank: viable seeds for at least 9 yr, each generation releasing seeds later in season.
- ▶ For newest additions to seedbank, 1st germinate very early April.
 - 50% germinated by May 1;
90% by May 16.
 - missing the window ??

Conclusions

- ▶ Delayed 1st and peak germination over time creates overlapping generations, making exact timing for control very difficult.
- ▶ GDD: newest pop needs ~ 360-400 (Jan. 1) or 280-300 (Feb. 1).

Conclusions

- ▶ If your management program is working for you, stick with it!!
- ▶ If not, consider changing the timing of application, especially if new seed was deposited last year.

2006 Field Trials with Compound H

Funds provided by:

The Cranberry Institute
Cranberry Research Foundation
Syngenta Professional Products

Target Weeds

- ▶ Nutsedge
- ▶ NLGR
- ▶ Loosestrife
- ▶ Sawbrier (silverleaf)
- ▶ Dewberries

Herbicide Rates

(all except nutsedge)

- ▶ 0.125 lb a.i./A
- ▶ 0.25 lb a.i./A
- ▶ 0.25 lb a.i./A (2 applications)
- ▶ 0.375 lb a.i./A
- ▶ 0.50 lb a.i./A
- ▶ Untreated

Herbicide Rates

(Nutsedge only)

- ▶ 0.25 lb a.i./A
- ▶ 0.375 lb a.i./A
- ▶ 0.25 lb a.i./A (2 applications)
- ▶ 0.375 + 0.125 lb a.i./A
- ▶ Untreated

Application Dates

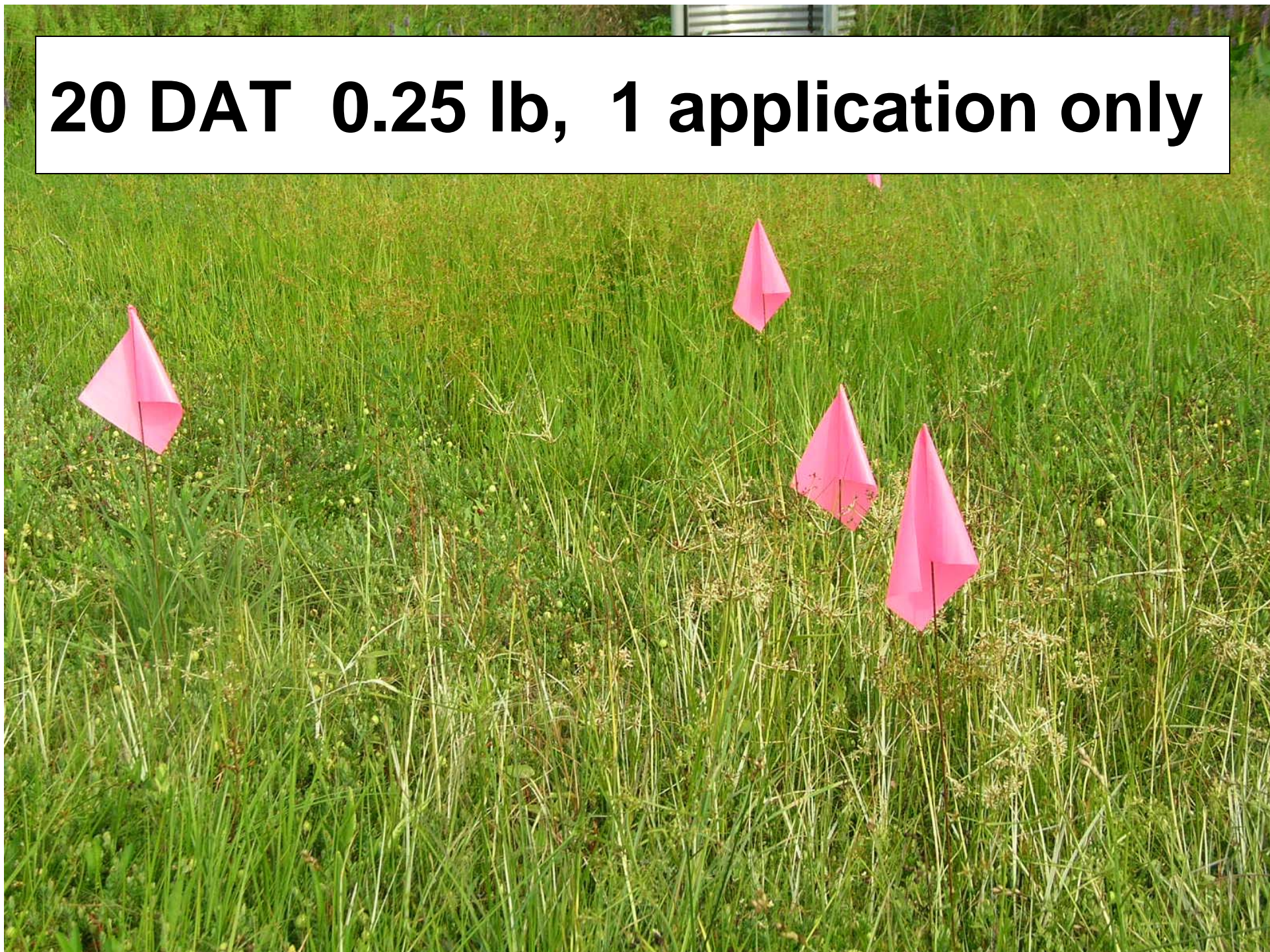
- ▶ Nutsedge: July 7 & July 28
 - 21 days

- ▶ NLGR, YLS, SB, and DB:
July 14 & August 11
 - 28 days

Nutsedge Untreated



20 DAT 0.25 lb, 1 application only



20 DAT, 0.375 lb, 1 application only



47 DAT
1 app
0.375 lb



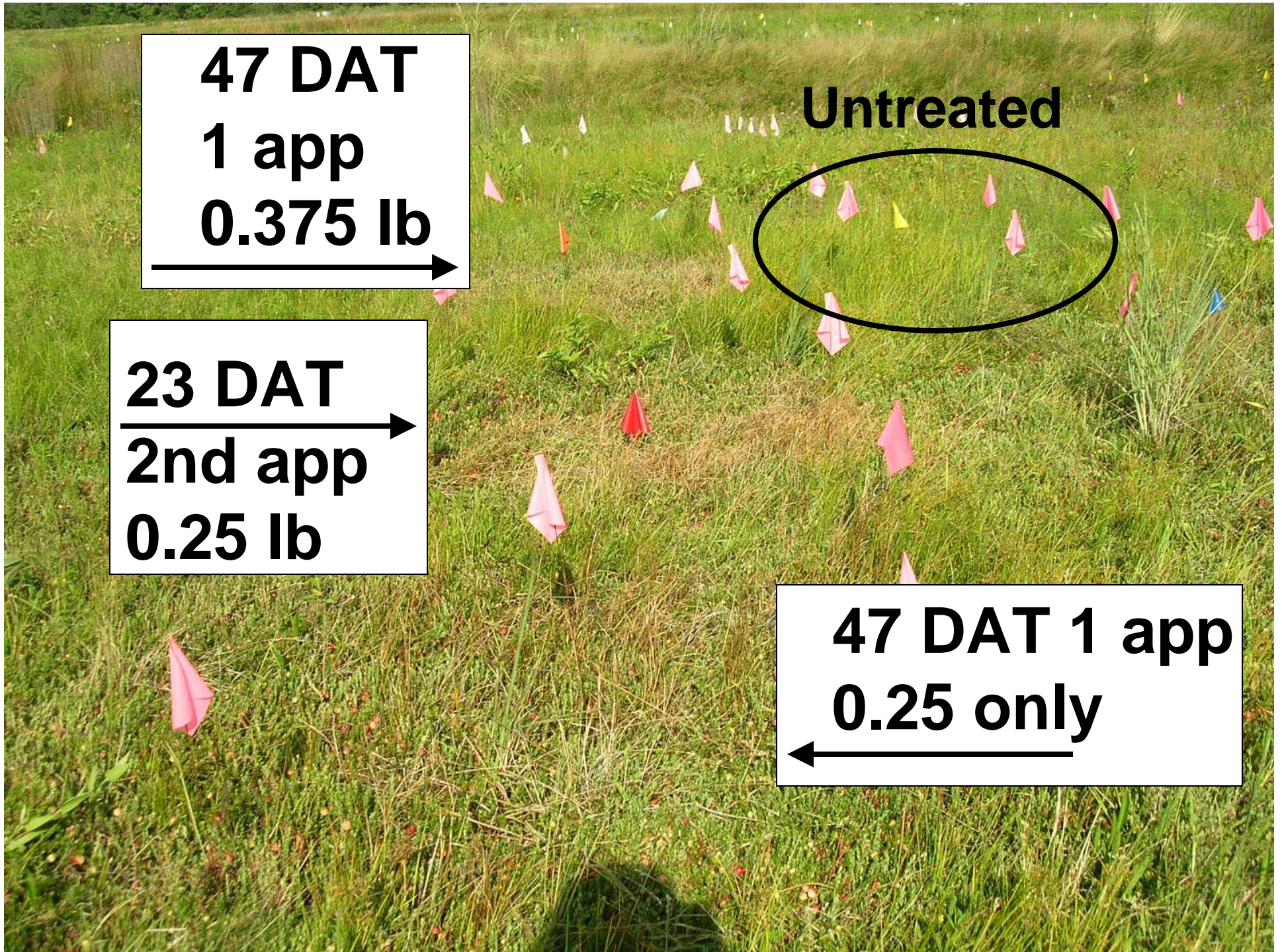
23 DAT
2nd app
0.25 lb



Untreated



47 DAT 1 app
0.25 only





Untreated

47 DAT
1st app 0.375
23 DAT
2nd app 0.125

Broadleaf weeds

NLGR, Loosestrife
Dewberry, Sawbrier

Dewberry - 13 DAT



NLGR - 13 DAT



Sawbrier - 13 DAT



Loosestrife - 13 DAT





**Following pictures taken
August 31, 2006**

48 days after Trmt #1

20 days after Trmt #2





0.25 lb/A rate applied twice



NLGR 48 DAT #1



2 applications
0.25 lb ai/A



1 application
0.50 lb ai/A

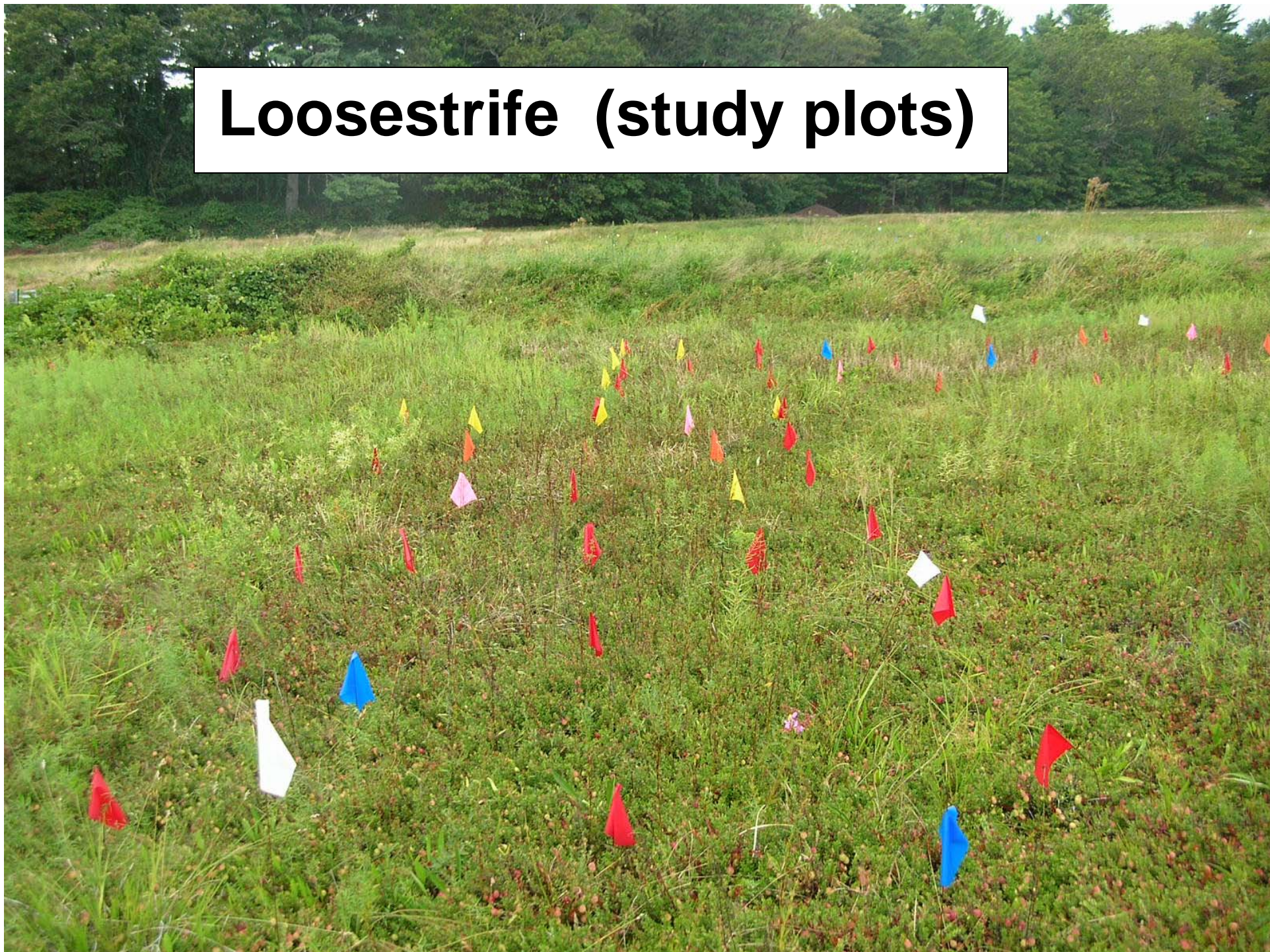


Sawbrier (silverleaf)





Loosestrife (study plots)



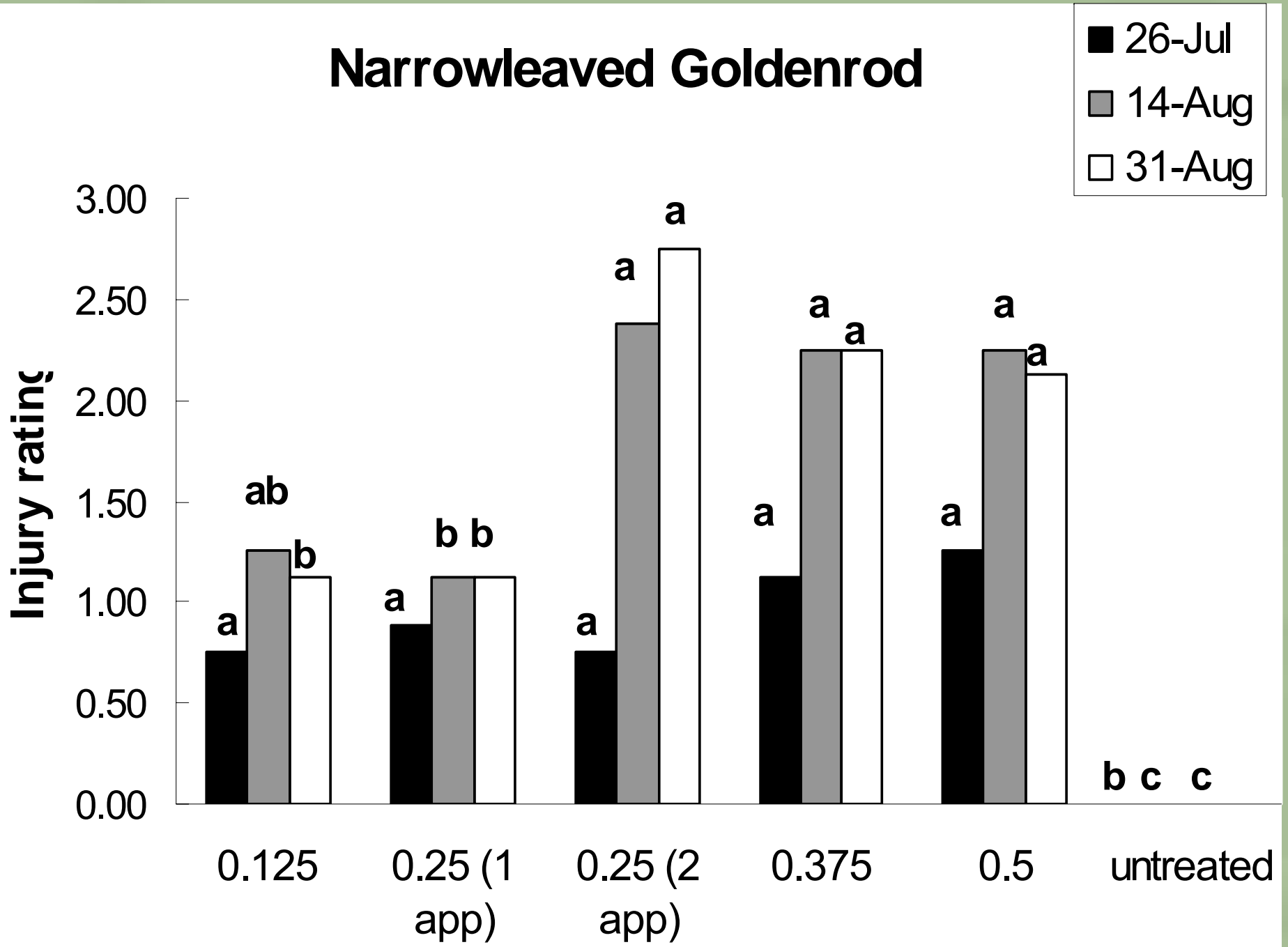
1 application
0.25 lb ai/A



1 application
0.50 lb ai/A



Narrowleaved Goldenrod



Conclusions

- ▶ Nutsedge: good to excellent control at all trmt rates.
- ▶ NLGR, YLS, SB, and DB:
 - Best results with 2 applications of 0.25 lb ai, but still not great.
 - Multiple year applications ?
- ▶ Excellent crop tolerance.

Conclusions

- ▶ Full label should be available in 2008.
- ▶ I am looking for research sites for 2007!!

Plant Diversity in Stockpiled Sand: Weed Management Implications





Objectives

- ▶ Describe seedbank in multiple commercial locations
- ▶ Develop simple bioassay that could allow for evaluation of seedbank

Sample Collection

- ▶ 4x / yr from MA, NJ, WA, WI.
 - 4 farms in each region
 - 2 depths: surface & interior (0.7 m)
- ▶ Samples shipped to MA

Sample Collection

- ▶ Mixed 1:1 (v:v) soilless peat : sand.
- ▶ Spread into shallow trays.
- ▶ Trays stirred @ 6 & 12 wk.
- ▶ Seedlings removed, transplanted, & identified.

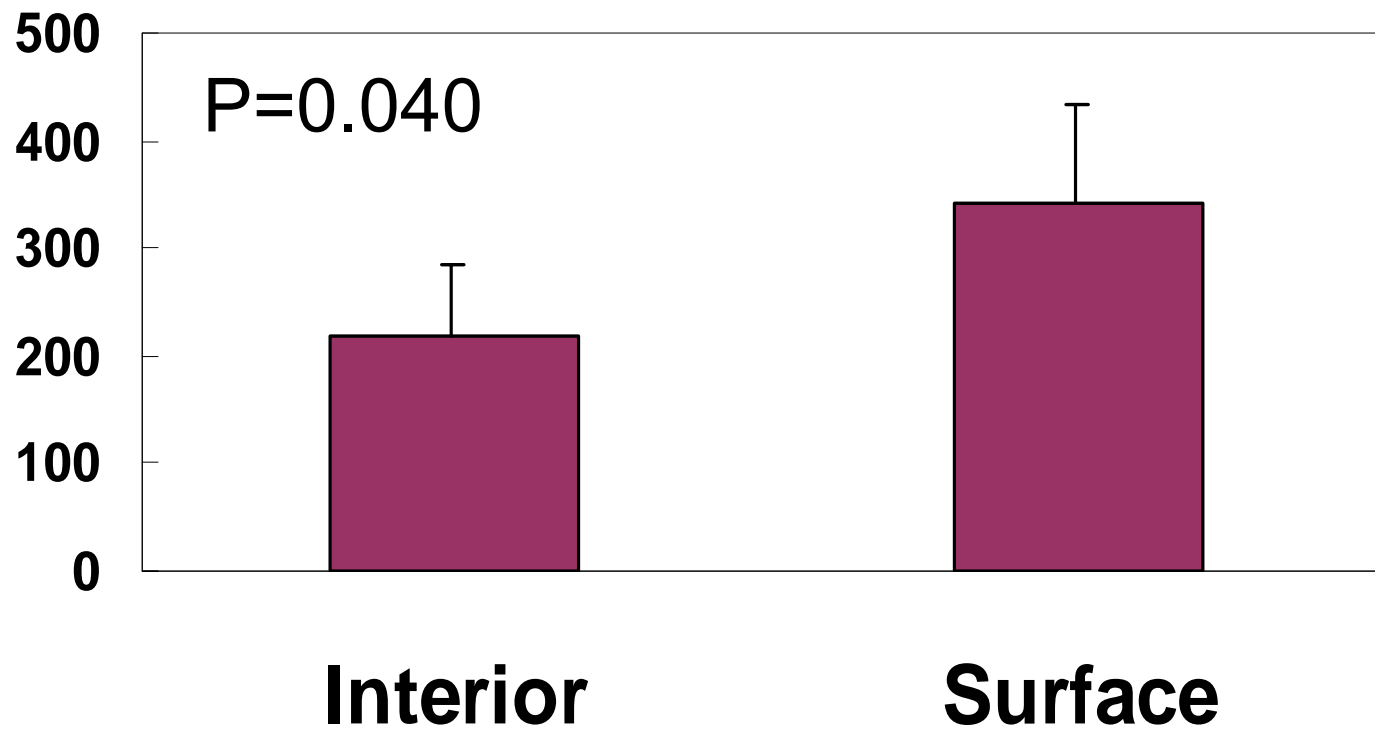
Germination / ID Process



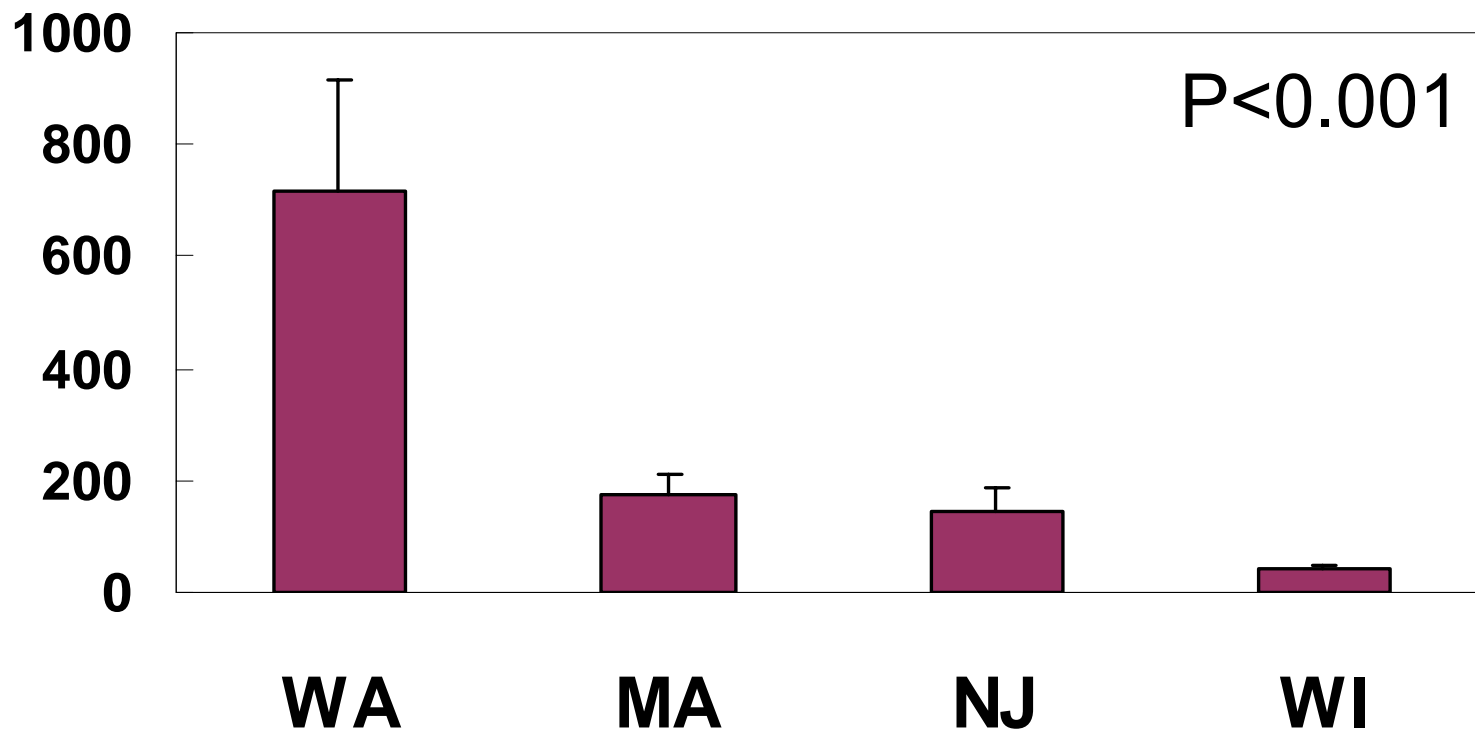
Survey Findings

- ▶ 4,731 emerged seedlings
- ▶ 23 plant families; 74 species
- ▶ ID: 74% to species; 15% to genus
 - < 2% were not identified
- ▶ 25% trays had 0 germinated seedlings.

No. Germinated Seedlings / m² By Sample Location




No. Germinated Seedlings / m² By Growing Region

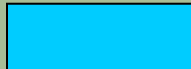



No. Germinated Seedlings / m²

High Densities

Common name	MA	NJ	WA	WI
Crabgrass	20.7 ± 11	5.2 ± 2.1	1.3 ± 0.6	5.5 ± 2.7
Creeping buttercup	nd	nd	74.2 ± 23.1	nd
Ladysthumb	1.1 ± 1.1	nd	88.0 ± 24.8	0.8 ± 0.6
Large crabgrass	0.7 ± 0.5	16.2 ± 14.0	nd	1.8 ± 1.8
Oldfield toadflax	15.6 ± 4.5	86.2 ± 33.5	5.8 ± 3.1	nd
Yellow woodsorrel	16.2 ± 3.4	7.5 ± 1.9	16.2 ± 3.7	8.8 ± 1.9

Minor problem 

Moderate problem 

Serious problem 

Seedling Occurrence (%)

Frequent

Common name	MA	NJ	WA	WI
Carpetweed	7	nd	4	17
Corn spurrey	1	5	28	nd
Crabgrass	29	14	7	16
Ladysthumb	1	nd	40	5
Oldfield toadflax	36	25	11	nd
Rush	10	nd	33	3
Yellow woodsorrel	40	25	40	31

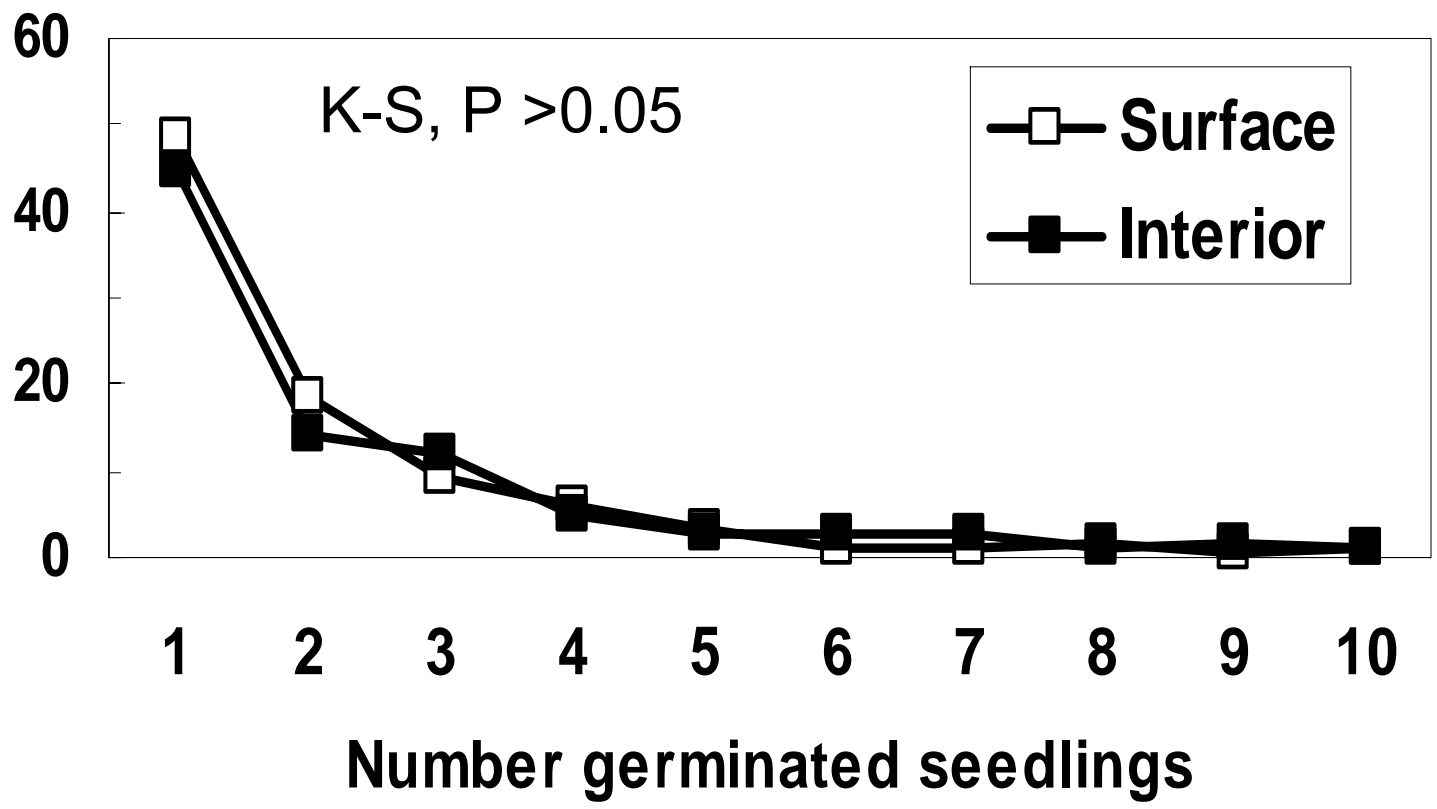
Minor problem 

Moderate problem 

Serious problem 

Species Representation by seedling number

Frequency of occurrence (%)



It's important because...

- ▶ 1 plant per tray =
~ 16 plants per square
yard

Conclusions

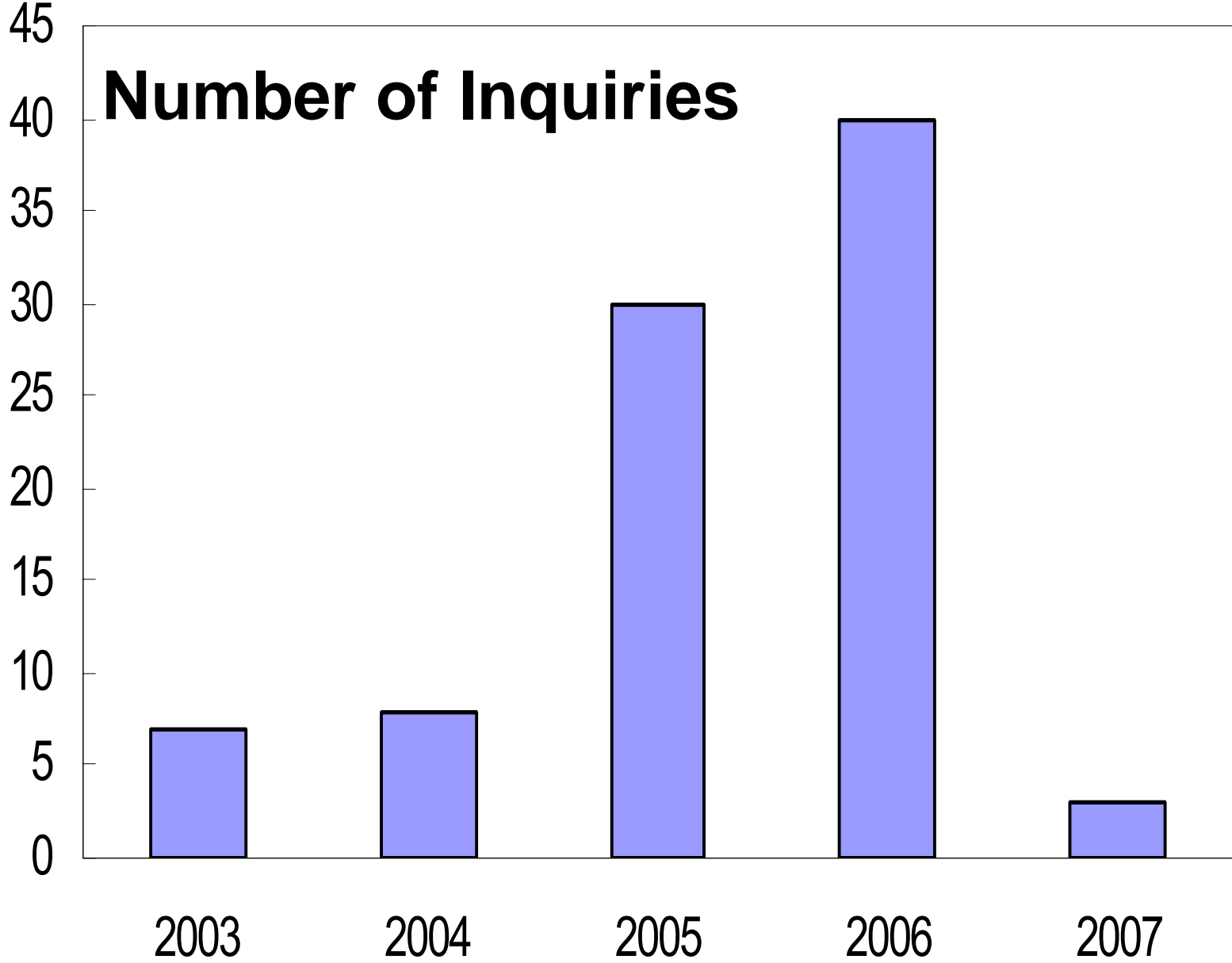
- ▶ Stockpiled sand can be reservoir for weed seeds.
- ▶ More seedlings on surface than interior.
 - Cover small piles
 - Try not use surface sand

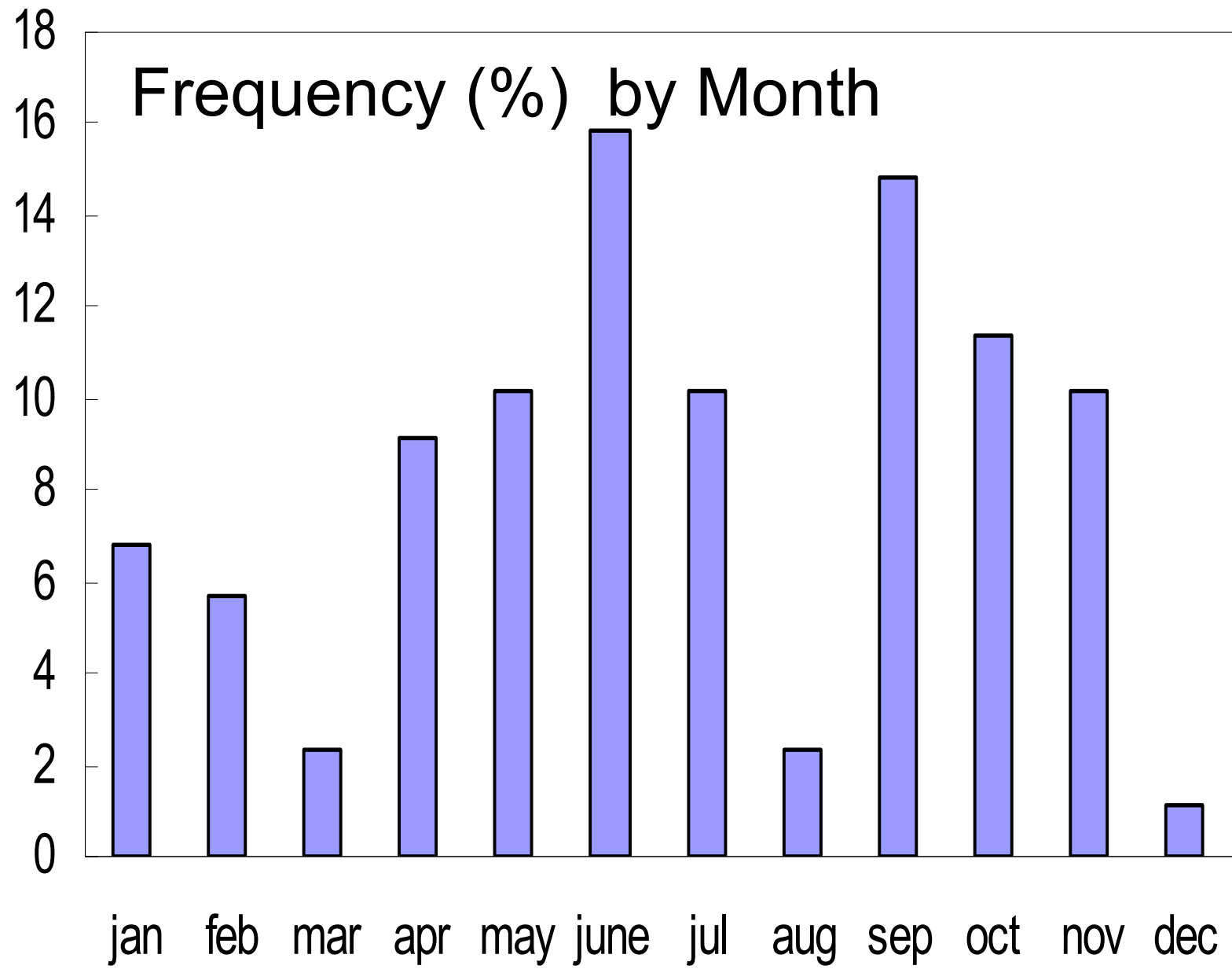
Conclusions

- ▶ Evaluate sand prior to use.
 - Wide variability indicates need to evaluate on farm – by - farm basis
- ▶ Bioassay is simple to use, low-cost.

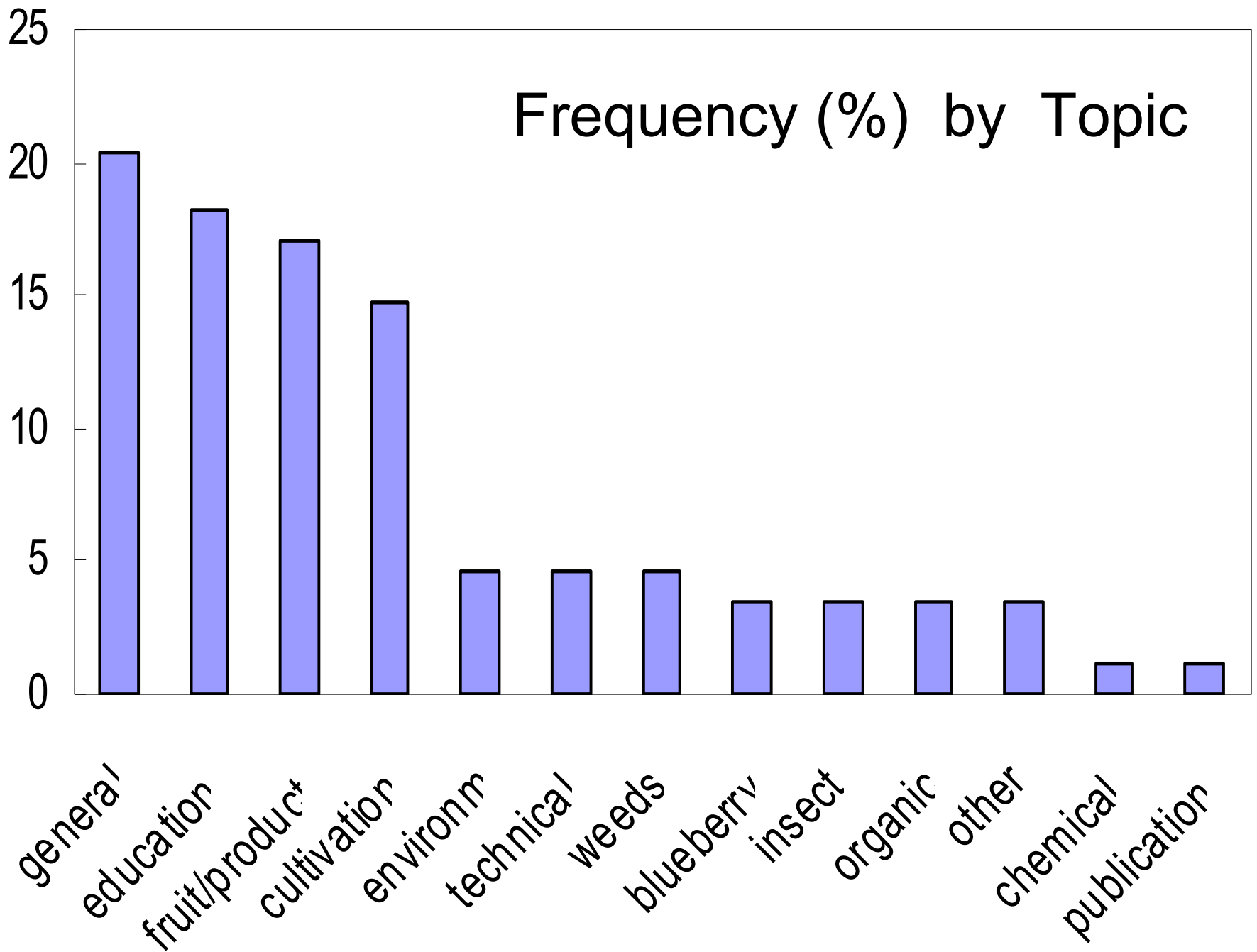
UMass Cranberry Station Web Site

When ?
Where ?
What ?

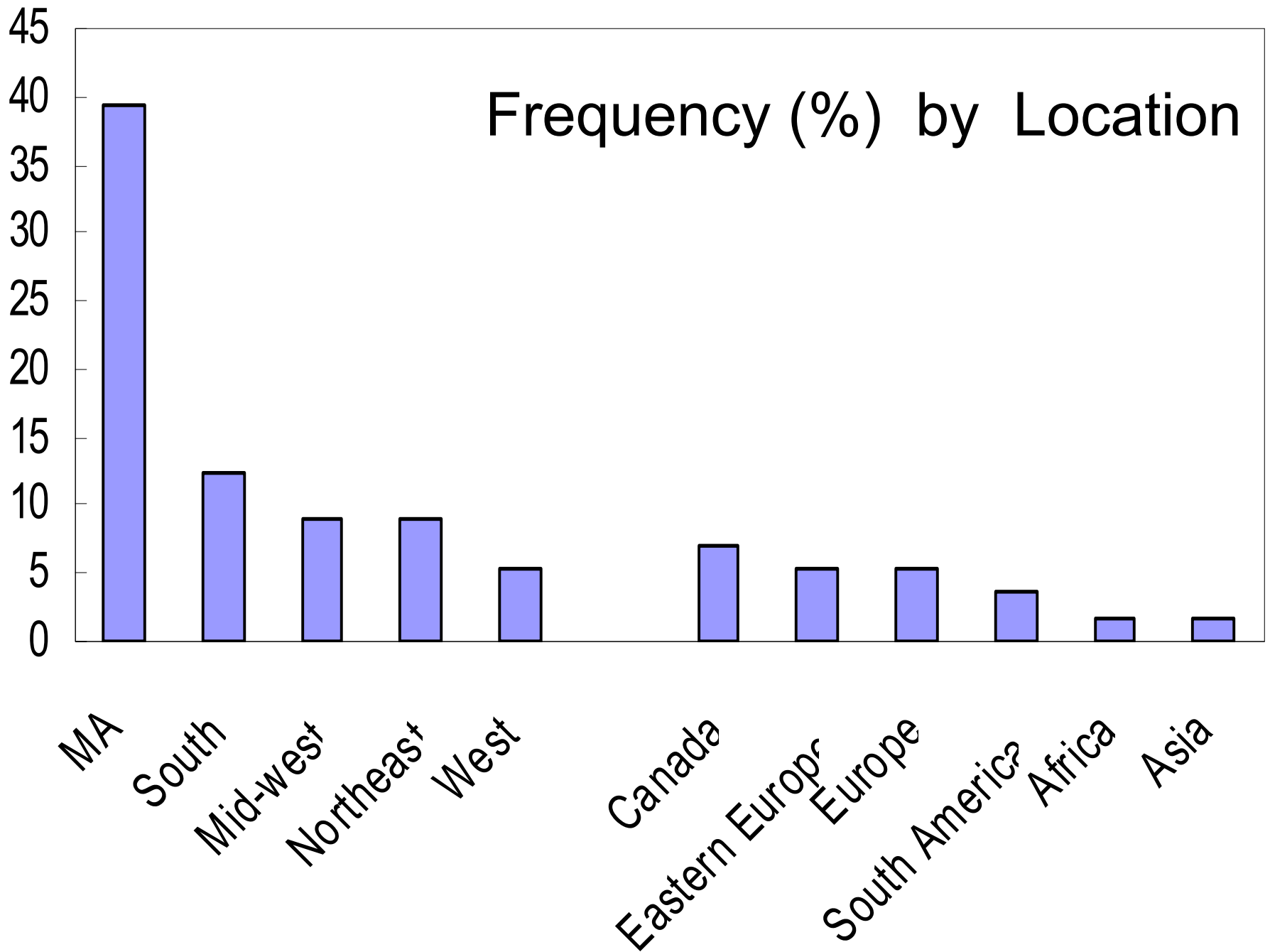




Frequency (%) by Topic



Frequency (%) by Location





QUESTIONS ??