Nutsedge Control in Turfgrass

practical approaches to consider

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ARIZONA COOPERATIVE EXTENSION

Nutsedge Control in Turfgrass

- Biological
- Cultural
- Chemical

Nutsedge Control in Turfgrass

- Biological
  - Insects
  - Diseases

Nutsedge Control in Turfgrass

- Cultural
  - Solarization
  - Mechanical
    - Hand-pulling, hoeing
    - Tillage
  - Mowing

Nutsedge Control in Turfgrass

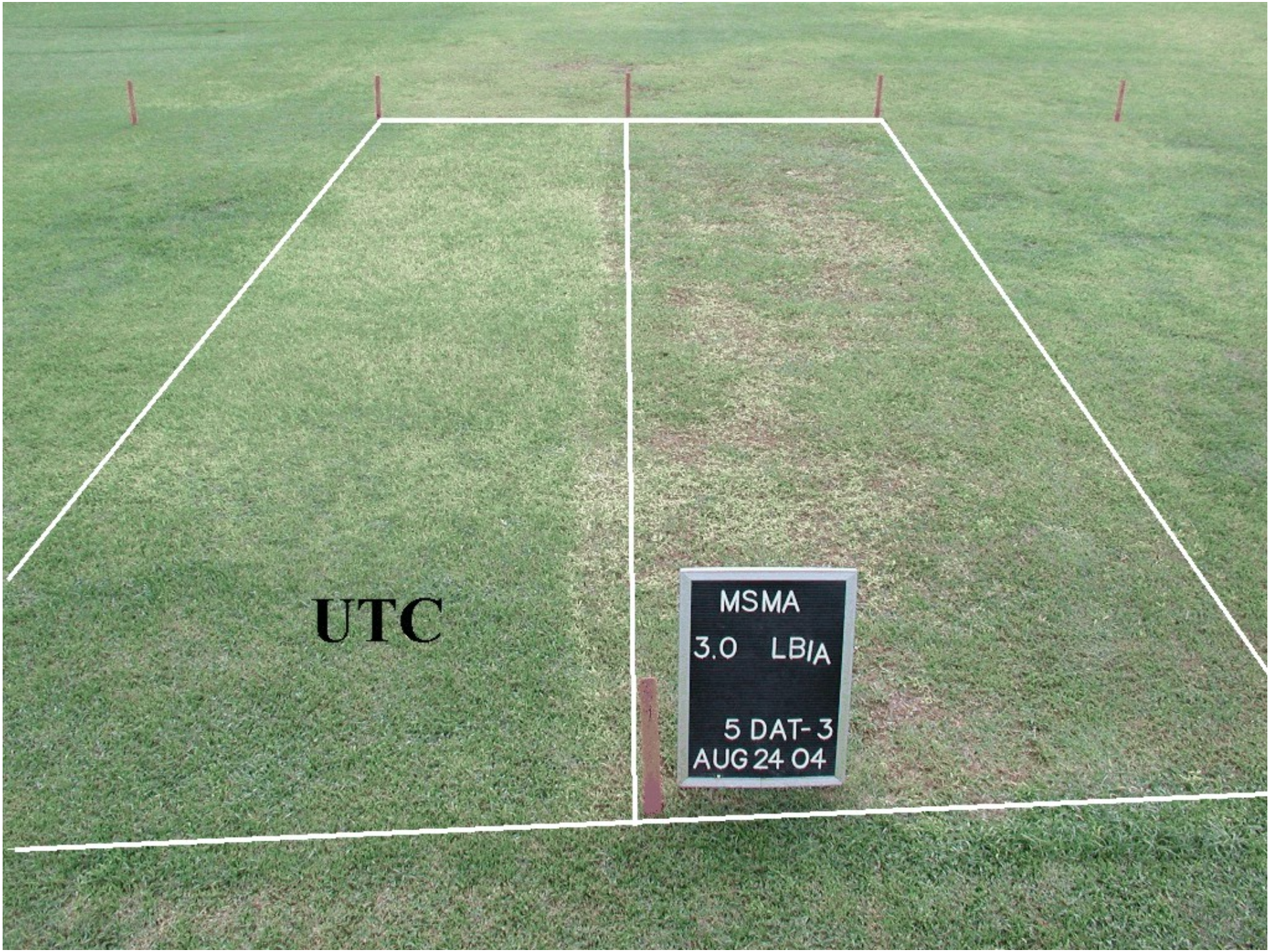
- Chemical
  - Preemergence
    - Fumigants
    - Soil-applied herbicides
  - Postemergence
    - Foliar-applied herbicides

Nutsedge Control in Turfgrass

- Chemical
  - Preemergence
    - Fumigants
      - Methyl bromide
      - Metam-sodium
    - Soil-applied herbicides
      - Metolachlor (*Pennant**)

Nutsedge Control in Turfgrass

- Chemical
  - Postemergence
    - Triazine herbicides
      - (simazine, atrazine)
    - 2,4-D
    - MSMA, DSMA
      - Requires multiple applications
    - Glyphosate (*Roundup**)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MSMA
3.0 LBIA
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Advances in Chemical Control of Nutsedge in Turfgrass

- Discovery of ALS inhibiting herbicides in the 1980's
- ALS enzyme in plants stopped
  - Production of 3 amino acids reduced
  - valine, leucine, isoleucine
- Imidazolinone and sulfonylurea herbicides

Advances in Chemical Control of Nutsedge in Turfgrass

- Imidazolinone and sulfonylurea herbicides
  - Imazaquin (*Image**)
  - Halosulfuron (*SedgeHammer** [*Manage**])
  - Trifloxysulfuron (*Monument**)
  - Sulfosulfuron (*Certainty**)
  - Flazasulfuron (proposed *Katana**)

Advances in Chemical Control of Nutsedge in Turfgrass

- Imidazolinone chemistry
  - *Image** herbicide
    - Uptake into plants through roots and shoots
    - Translocated to the growing points
    - Effective when combined with MSMA

Advances in Chemical Control of Nutsedge in Turfgrass

- Imidazolinone chemistry
  - *Image** herbicide
    - Immediately stops plant growth
    - Causes yellowing or chlorosis in 3-7 days
      - Burns with MSMA
    - Complete death of nutsedge in 2 weeks

Advances in Chemical Control of Nutsedge in Turfgrass

- Imidazolinone chemistry
  - *Image** herbicide
    - Effective rate at 0.5 lb AI/A
      - 0.26 oz product (70DG)/1000 ft^2
      - 11.4 oz product (70DG)/A
    - Add adjuvant (non-ionic surfactant)
    - Combine with MSMA
      - 2 to 3 lb AI/A

Advances in Chemical Control of Nutsedge in Turfgrass

- Sulfonylurea chemistry
  - *SedgeHammer**, *Monument**, *Certainty** herbicides
    - Uptake into plants through roots and shoots
    - Translocated to the growing points

Advances in Chemical Control of Nutsedge in Turfgrass

- Sulfonylurea chemistry
  - *SedgeHammer** herbicide
    - Effective rate at 0.062 lb AI/A
      - 1.3 oz product (75WG)/A
      - 0.03 oz product (75WG)/1000ft^2
    - Add non-ionic surfactant at 0.25 to 0.5% (v/v)

Advances in Chemical Control of Nutsedge in Turfgrass

- Sulfonylurea chemistry
  - *Monument** herbicide
    - Effective rate at 0.026 lb AI/A
      - 0.56 oz product (75DG)/A
      - 0.013 oz product (75DG)/1000ft^2
    - Add adjuvant
      - non-ionic surfactant at 0.25 to 0.5% (v/v)
      - Methylated seed oil (MSO)
      - Crop oil concentrate (COC)

Advances in Chemical Control of Nutsedge in Turfgrass

- Sulfonylurea chemistry
  - *Certainty** herbicide
    - Effective rate at 0.06 lb AI/A
      - 0.75 to 1.25 oz product (75 WDG)/A
      - 0.8 gm product (75 WDG)/1000ft^2
    - Add adjuvant
      - non-ionic surfactant at 0.25 to 0.5% (v/v)
    - Add MSMA

Advances in Chemical Control of Nutsedge in Turfgrass

- Imidazolinone and sulfonylurea chemistries
  - Repeat applications needed in severe infestations during a growing season
  - More than 1 year to significantly reduce populations
  - Turfgrass may be injured
    - Seedhead suppression

Advances in Chemical Control of Nutsedge in Turfgrass

- Multiple applications needed in a year
  - *Image**
    - Limit not stated
  - *SedgeHammer**
    - 6 to 10 week interval
    - Limited to 4 applications not exceeding 5.3 oz/A
  - *Monument**
    - 6 week interval
    - Limited to 1.7 oz/A
  - *Certainty**
    - 4 to 10 week interval

Field Trial Results 2004 and 2005

- 1 to 4 applications made in 2004 followed by 2 more applications in 2005

Halosulfuron 4 + 2	91%
Halosulfuron 3 + 2	88%
Monument 2 + 2	97%
Monument 3 + 2	95%
Image 3 + 2	91%
Certainty 1 + 2	95%

Field Trial Results 2005

- Applications initiated in May, June, and July
  - Overseeded ryegrass infested with nutsedge in May
  - Transition occurred during June
  - Bermudagrass only in July

Field Trial Results 2005

- SedgeHammer* and MSMA relatively safe on ryegrass with reduction of nutsedge
- Image* and Certainty* not safe on ryegrass and effective against nutsedge
- 4 applications starting in May or June vs

  3 applications starting in July
  - Monument*, Certainty*, Image*, SedgeHammer*

Field Trial Results 2005

- MSMA at 3.0 lb AI/A multiple applications reduced nutsedge
  - Relatively safe on overseeded ryegrass
- MSMA tank-mixed with Image*
- MSMA applied first followed by Certainty
  - Tank-mixed with Certainty
    - No advantage

MSMA Efficacy Against Nutsedge

- Can begin applications earlier in spring with ryegrass still present
- Apply every 2-4 weeks
- Weaken nutsedge before summer applications of other chemistries
  - Initiate other chemistry applications in July and make 2-3 treatments
    - Shorter daylength

Comparison of Herbicides for Nutsedge Control

*Image**	*SedgeHammer**	*Monument**	*Certainty**
70 DG	75 WDG	75 WG	75 WDG
imazaquin	halosulfuron	trifloxysulfuron	sulfosulfuron
0.5 lb AI/A	0.062 lb AI/A	0.026 lb AI/A	0.096 lb AI/A
11.4 oz/A	1.3 oz/A	0.56 oz/A	1.25 oz/A
0.26 oz/1000ft^2	0.03 oz/1000ft^2	0.013 oz/1000ft^2	0.028 oz/1000ft^2
No limit	4 applications 5.3 oz/A total	1.7 oz/A total	2.66 oz/A total/year

Comparison of the Safety of Herbicides for Nutsedge Control

Warm-season turfgrass use

*Image**	*Manage**	*Monument**	*Certainty**
bermudagrass St. Augustinegrass zoysiagrass	creeping bentgrass Ky bluegrass perennial ryegrass fine/tall fescue bermudagrass kikuyugrass seashore paspalum St. Augustinegrass zoysiagrass	bermudagrass zoysiagrass	bermudagrass St. Augustinegrass zoysiagrass kikuyugrass centipedegrass creeping bentgrass

Comparison of the Safety of Herbicides for Nutsedge Control

DO NOT USE on Sensitive Turfgrasses

*Image**	*SedgeHammer**	*Monument**	*Certainty**
golf/bowling greens bentgrasses perennial ryegrass *Poa trivialis* tall fescue dichondra	golf course greens	golf course greens dichondra other unlabeled turfgrasses	golf course greens or w/in 4 ft of greens

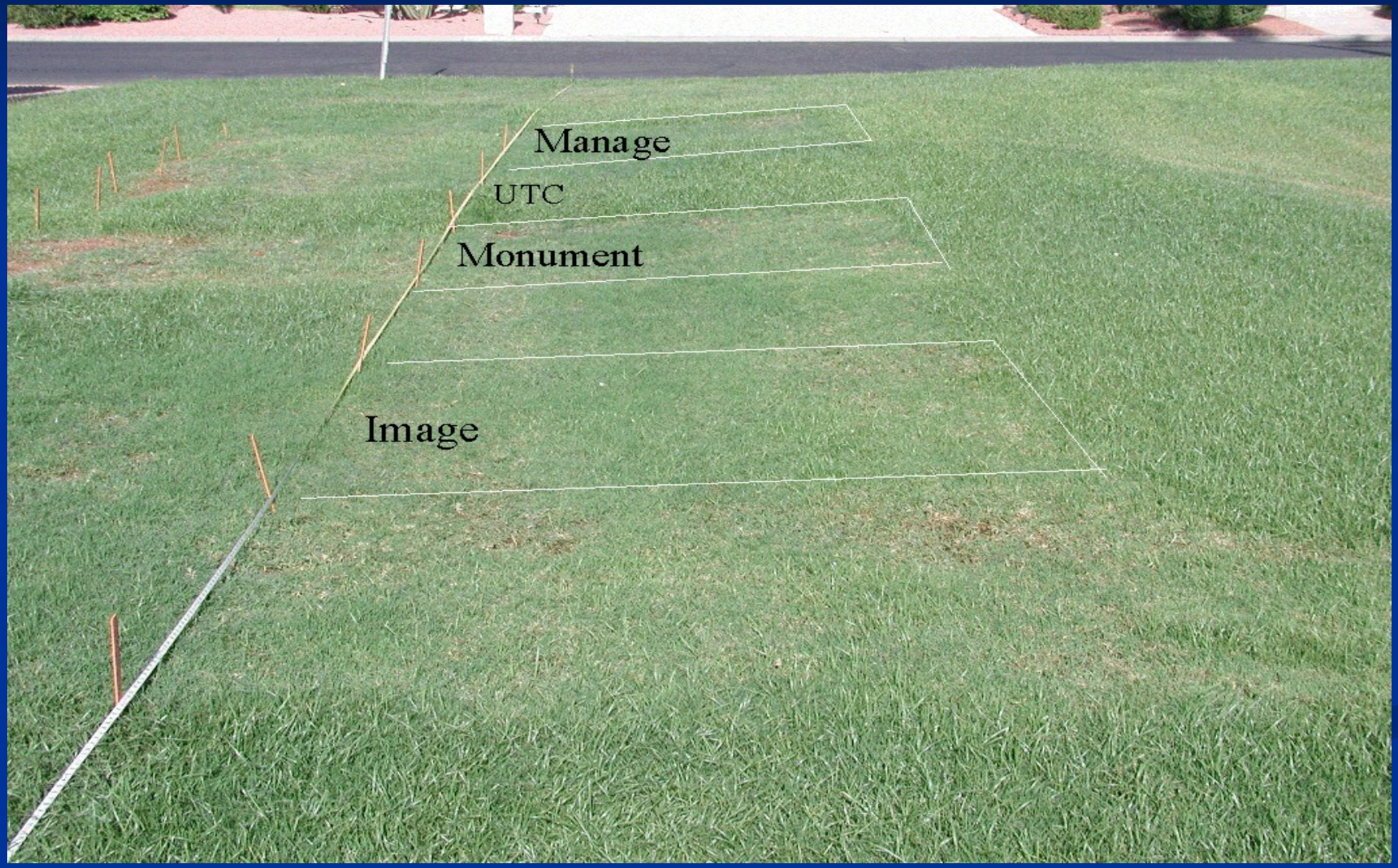
Newly seeded, sodded, or sprigged turfgrasses

Comparison of the Safety of Herbicides for Nutsedge Control

Interval to Fall Overseeding

*Image**	*SedgeHammer**	*Monument**	*Certainty**
1-1/2 months after treatment	2 weeks after application	6 weeks after last application	not determined

Field Experiment – 1 application



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