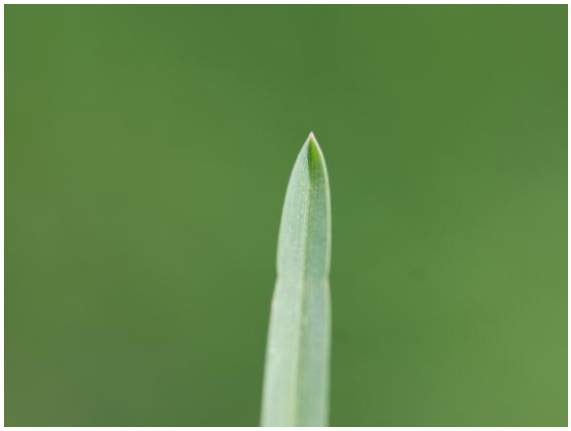
PURDUE UNIVERSITY PURDUE EXTENSION

Annual Bluegrass Biology

- Scientific name: *Poa annua*
- Winter annual
- Capable of surviving close mowing, frequent irrigation, aerification, fertilization, etc.
- Perennial biotypes exist, especially in greens



PURDUE UNIVERSITY PURDUE EXTENSION

Poa annua biology

- Seed bank:
  - 110 viable seeds/in^2 greens
  - 70 viable seeds/in^2 fairways
- 80% of seed in greens germinates immediately
- Germination peaks in early Oct at ~ 70F average air temps

Lush, W.M. 1988. Biology of *Poa annua* in a temperate zone golf putting green (Agrostis stolonifera/Poa annua) I. The above-ground population. Journal of Applied Ecology. 25:977-988.
Kaminski, J. E., and P. H. Dernoeden. 2007. Seasonal Poa annua L. seedling emergence patterns in Maryland. Crop Sci. 47(2):p. 775-781.

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Annual bluegrass Biology

- *Poa annua* germinates in late summer to early fall at soil temperatures around 70 F.
- A second germination flush may occur in mid- to late-winter

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PURDUE EXTENSION

Cultural Control Strategies

- Prevention/Exclusion

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PURDUE EXTENSION

Cultural Control Strategies

- Irrigation
- N rate
- N timing
- Aerification timing

PURDUE EXTENSION

CAUTION

Herbicides will cause you problems if you intend to establish (seed, spring, sod) turf in the future. Know the restrictions before you proceed!

PURDUE EXTENSION

Poa annua control in cool-season turf?

PURDUE EXTENSION

Annual bluegrass control in cool-season turf

- Options for control
  - Ethofumesate (Prograss)
    - Two sequential fall applications spaced three to four weeks apart. A spring application of Prograss may also improve control when applied following fall applications. Certain Kentucky bluegrass cultivars may be injured by Prograss when applied at 0.5 gallon/acre as indicated on the label.
  - Tenacity (mesotrione)
  - Xonerate (amicarbazone)
  - ~~Velocity (bispyrabac-sodium)~~ – Sod and Golf only

PURDUE EXTENSION

PROGRASS® Herbicide

Prograss (ethofumesate)

- Most effective when applied in fall as two sequential applications spaced three to four weeks apart.
- Rate varies by species:
  - Kentucky bluegrass rate is 0.5 gallon/acre
  - Tall fescue rate is 0.5-1.0 gallon/acre
  - Perennial ryegrass rate is 0.66-1.33 gallon/acre
- Inconsistent control

Tenacity- Golf and Sod Labeled Uses

- Bleacher
- PRE and POST broadcast applications (5-8 fl oz/A)
- Repeat POST applications at 2-3 weeks
  - + NIS
- New seedings:(except fine fescues) 5-8 fl oz/A
  - Prior to or post-seeding
  - Avoid newly germinated seedlings
- 16 fl oz/A per year max
  - (0.50 lbs ai/A) maximum

Turf Species	Rate
K. bluegrass Tall fescue	5-8 fl oz/A (0.156-0.25 lb ai/A)
P. ryegrass Fine fescue	5 fl oz/A (0.156 lb ai/A)

Tenacity® Herbicide

Tenacity

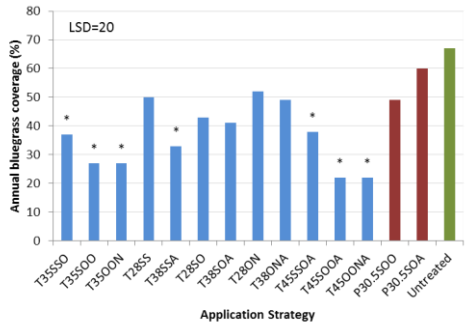
WEEDS CONTROLLED

Common Name	Scientific Name	Preemergence[1]	Postemergence[2]
Barnyardgrass	*Echinochloa crusgalli*	Y	Y
Bentgrass, Creeping	*Agrostis stolonifera*	Y	Y
Bluegrass, Annual	*Poa annua*	Suppression	N
Buckhorn Plantain	*Plantago lanceolata*	Y	Y
Buttercup	*Ranunculus sardous*	-[3]	Y
Carpetweed	*Mollugo verticillata*	Y	Y
Chickweed, Common	*Stellaria media*	Y	Y
Chickweed, Mouseear	*Cerastium vulgatum*	Y	Y
Clover, Large Hop	*Trifolium aureum*	Y	Y
Clover, White	*Trifolium repens*	Y	Y
Crabgrass, Large	*Digitaria sanguinalis*	Y	Y[4]
Crabgrass, Smooth	*Digitaria ischaemum*	Y	Y[4]
Crabgrass, Southern	*Digitaria ciliaris*	Y	Y[4]
Curly dock	*Rumex crispus*	-	Y
Dandelion, Catsear	*Hypochoeris radicata*	-	Y
Dandelion, Common	*Taraxacum officinale*	-	Y
Florida Betony	*Stachys floridana*	-	Y
Florida Pusley	*Richardia scabra*	-	Y
Foxtail, Yellow	*Setaria glauca*	Y	Y

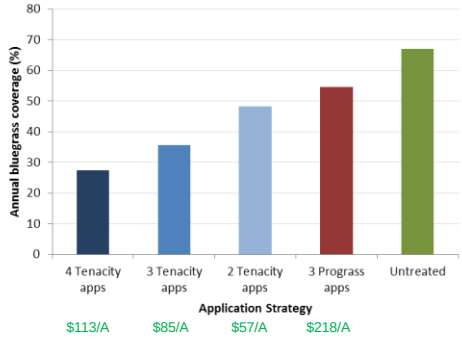
PURDUE UNIVERSITY — PURDUE EXTENSION

Herbicide	Rate	Number of applications	Application timing[a]
	oz prod/A		
Tenacity[b]	5	3	mid Sept, end Sept, mid Oct
Tenacity	5	3	end Sept, mid Oct, end Oct
Tenacity	5	3	mid Oct, end Oct, mid Nov
Tenacity	8	2	mid Sept, end Sept
Tenacity	8	3	mid Sept, end Sept, mid April
Tenacity	8	2	end Sept, mid Oct
Tenacity	8	3	end Sept, mid Oct, mid April
Tenacity	8	2	end Oct, mid Nov
Tenacity	8	3	mid Oct, mid Nov, mid April
Tenacity	5	4	mid Sept, end Sept, mid Oct, mid April
Tenacity	5	4	end Sept, mid Oct, end Oct, mid April
Tenacity	5	4	mid Oct, end Oct, mid Nov, mid April
Prograss	64	3	mid Sept, early Oct, late, Oct
Prograss	64	3	mid Sept, early Oct, mid April
Untreated			

PURDUE UNIVERSITY — PURDUE EXTENSION



PURDUE UNIVERSITY — PURDUE EXTENSION



PURDUE UNIVERSITY — PURDUE EXTENSION

Annual bluegrass control

- Three applications of Tenacity at 5 oz/A in the fall would be the best control strategy.
- Starting Tenacity applications in mid-September, end of September, or mid October all worked equally well.
- These results were obtained under the conditions of our experiment. Results will vary by location.

PURDUE UNIVERSITY PURDUE EXTENSION

IN and IL research

- *"Though acceptable control (> 80%) was obtained in some experiments, control was inconsistent or marginal depending on the location and year. Our current recommendations for fall-applied mesotrione would include three applications, starting in mid- to late September, at rates between 3 to 5 oz/A per application, and without follow-up applications in April."*

PURDUE UNIVERSITY PURDUE EXTENSION

Tenacity

A broad-spectrum herbicide with selective post-emergence and pre-emergence control of broad-leaved and grass weeds

PURDUE UNIVERSITY PURDUE EXTENSION

Weeds Controlled

Barnyardgrass	Foxtail, yellow	Pigweed, smooth
Bentgrass, creeping	Galinsoga	Purslane, common
Buckhorn plantain	Goosegrass	Shepherd's purse
Carpetweed	Ground ivy	Speedwell, purslane
Chickweed, common	Healall	Sowthistle
Chickweed, mouseear	Henbit	Swinecress
Clover, white	Lambsquarter, common	Thistle, Canada
Crabgrass, large	Marestail	Verbena
Crabgrass, smooth	Nimblewill	Wild Carrot
Curly dock	Nutsedge, yellow	Wild Violet
Dandelion, common	Oxalis	Windmillgrass

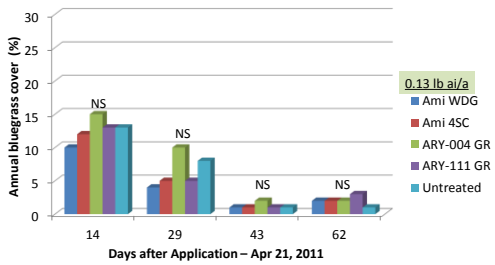
Kentucky bluegrass

PURDUE UNIVERSITY Xonerate Herbicide PURDUE EXTENSION

Xonerate (amicarbazone)

- New in 2012
- Xonerate at 2.0 to 4.0 oz/A at a 14- to 21-day interval for a maximum of two applications.
- Make applications of Xonerate in the spring when turf is actively growing and daily high temperatures do not exceed 85F.
- Do not apply in the summer or fall.

Effect of Amicarbazone Formulations on Annual Bluegrass Density. IN. 2011



0 = no annual bluegrass

PURDUE EXTENSION

What about *Poa annua* control in bermudagrass?

untreated treated

Annual bluegrass can be competitive as well as unattractive

PURDUE EXTENSION

Two approaches

- New chemistry
- Old chemistry
- Also known as …….

PURDUE EXTENSION

Annual Bluegrass Control

Herbicide	Rate	Timing
Roundup	16 oz	Dormant (January)
Simazine	1 lb	December
Atrazine	1 lb	December

Waiting until March or April to control annual bluegrass is a bad idea. Once it is well-tillered control with products such as simazine declines. Other problems with late control includes failure to remove competition for the emerging warm season grass and the appearance of the annual bluegrass carcasses in the turf.

PURDUE EXTENSION

Annual Bluegrass

- Roundup is a cheap, effective herbicide in dormant bermudagrass.
- Roundup does not provide any preemergence control.
- It is possible to have a second flush of annual bluegrass if Roundup is used.
- Tank mixing a preemergence herbicide with Roundup prevents this problem.

PURDUE EXTENSION

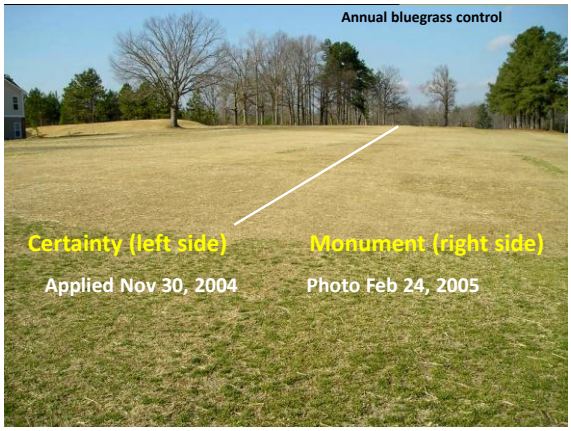
Annual Bluegrass

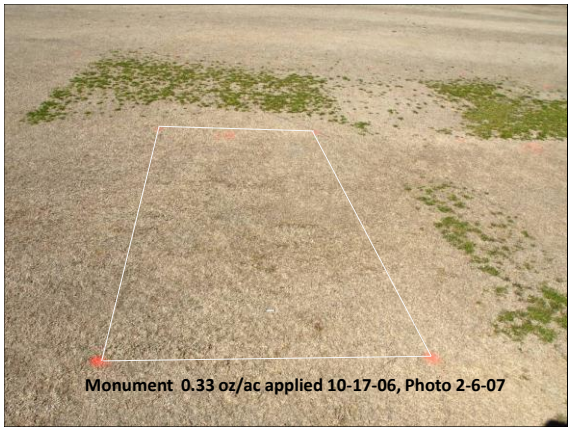
- Simazine or atrazine at 1.0 quart/acre applied in November-December.
- Repeat in February if needed.

PURDUE EXTENSION

Annual Bluegrass Herbicides

- Sulfonylurea herbicides for annual bluegrass
  - Monument - trifloxysulfuron
  - Revolver - foramsulfuron
  - Tranxit – rimsulfuron
  - Katana – flazasulfuron
  - Certainty - sulfosulfuron
- Postemergence control and some preemergence control.
- Good safety at any time on bermudagrass.

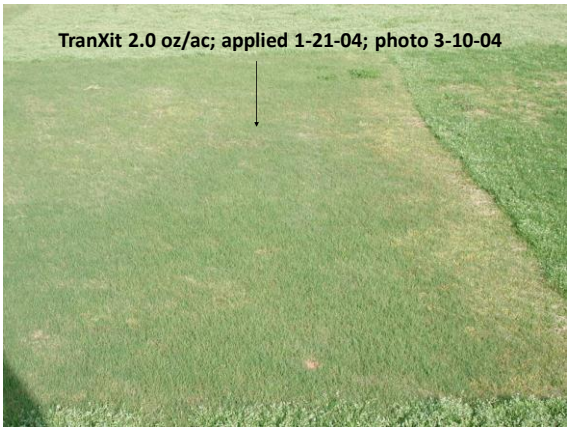


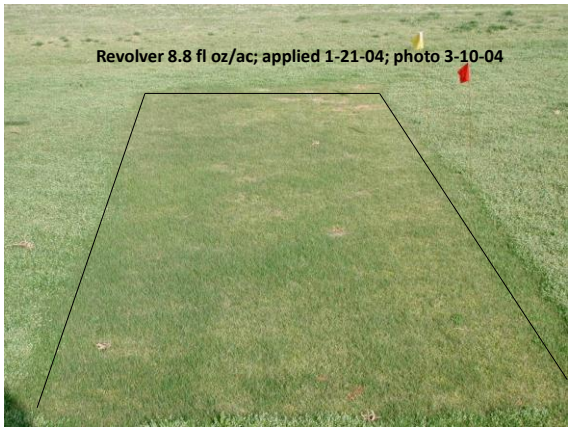



Monument 0.33 oz/ac; applied 1-21-04; photo 3-10-04

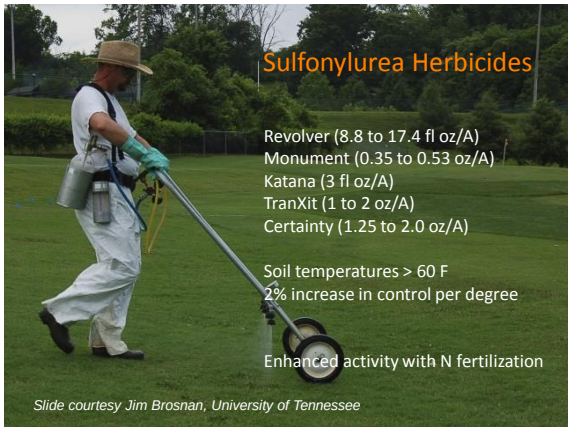

Monument + Barricade applied 10-17-06, Photo 2-6-07


Untreated, Photo 2-6-07

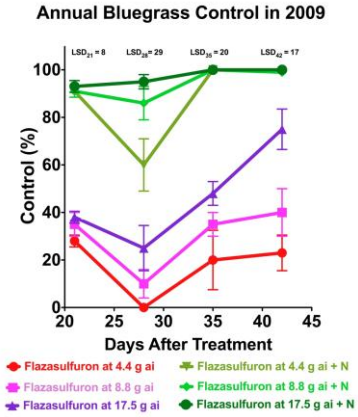

TranXit 2.0 oz/ac; applied 1-21-04; photo 3-10-04


Revolver 8.8 fl oz/ac; applied 1-21-04; photo 3-10-04


Annual bluegrass carcasses from late application.



Slide courtesy Jim Brosnan, University of Tennessee



PURDUE UNIVERSITY PURDUE EXTENSION

Field Results

- Annual bluegrass control greater with N fertility
  - 73, 59, 35 % increases for 0.25, 0.50, and 1.5 oz rates
  - Ammonium sulfate
- Control with 0.25 oz + N > 1.5 oz alone
  - 11 out of 12 dates across two years

PURDUE UNIVERSITY PURDUE EXTENSION

What about *Poa annua* control in **overseeded** bermudagrass?

Barricade at 0.75 lb/ai a, applied 10 weeks before overseeding

Barricade 0.5 lb/ai a, applied 10 weeks before overseeding

PURDUE EXTENSION

What about using *PGRs*? Will that work?

PURDUE EXTENSION

PGRs

- Paclobutrazol (Trimmit)
- Flurprimidol (Cutless)
- Flurprimidol + trinexapac-ethyl (Legacy)
- All three (Muskateer)

- Data on putting greens suggest these reduce annual bluegrass sometimes.

PURDUE EXTENSION

PGRs *continued*

- Regulates annual bluegrass more than creeping bentgrass allowing creeping bentgrass to fill in thin areas
- Won't likely work on athletic fields
  - Different species
  - Different cutting heights
  - Annual biotypes vs. perennial biotypes

PURDUE EXTENSION

What new experimental products are coming?

PURDUE EXTENSION

Methiozolin (MRC-01)

- Moghu Research Center in South Korea
- Registered in South Korea in 2010 and widely used
- Good safety on CB, TF, PR, KBG
- Good activity on *Poa annua* and *P. trivialis*
- PRE and POST activity – *unsure how exactly it works?*
- Current research at many locations
- Available in USA in 2015? Cost?

PURDUE UNIVERSITY PURDUE EXTENSION

Research Objective - FWY

- Determine the efficacy of MRC-01 for annual bluegrass control in a mixed creeping bentgrass/annual bluegrass fairway as influenced by rate and application timing.

PURDUE UNIVERSITY PURDUE EXTENSION

Methods

- Treatments (9):
  - MRC-01 treatments (4):
    - October 1 + November 1 @ 1.0 kg/ha at each application
    - October 1 + November 1 @ 2.0 kg/ha at each application
    - April 1 + May 1 @ 1.0 kg/ha at each application
    - April 1 + May 1 @ 2.0 kg/ha at each application
  - Velocity treatments (2)
    - October 1 + November 1 @ 6 oz/A at each application
    - April 1 + May 1 @ 6 oz/A at each application
  - Xonerate treatments (2)
    - October 1 + October 15 @ 2 oz/A at each application
    - April 1 + April 15 @ 2 oz/A at each application
  - Untreated control

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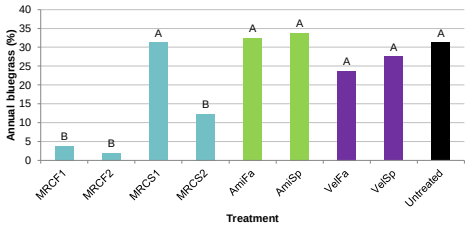
Annual bluegrass cover – 5/25



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Conclusions

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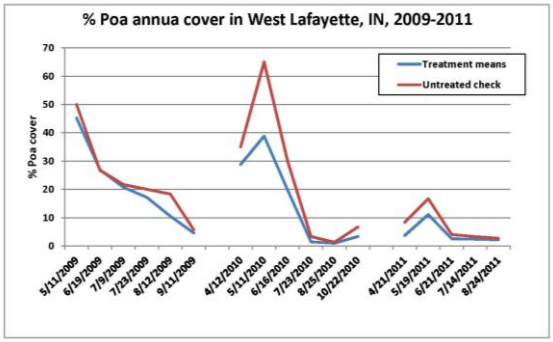
Things to keep-in-mind with <u>YOUR</u> annual bluegrass program

- Different biotypes from location to location
  - What works for you might not work for your neighbor
- Seasonal changes in ABG populations are natural
  - You need an untreated check



% Poa cover rated visually. Treatment means are averaged over 7 treatments.

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Where did it go?

- No matter which herbicide you will use *Poa annua* cover drops dramatically over the summer
- If no untreated area is included on your fields, you will likely deduce that your strategy is working even if it isn't

PURDUE UNIVERSITY PURDUE EXTENSION

Things to keep-in-mind with YOUR annual bluegrass program

- Stay ahead
- Hardest to control weed on planet?

Things that will survey after nuclear holocaust




Things that will survey after nuclear holocaust




www.agry.purdue.edu/turf

http://purdueturftips.blogspot.com/

A New Purdue Weed Control Publication:

Turfgrass Weed Control for Professionals

Dr. Aaron Patton and
Dan Weisenberger

Quick help for selecting herbicides for controlling specific weeds

Available July 17, 2012
88 pp. | 8.5 x 11
$12.00

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