

Poa annua control strategies for warm and cool season athletic fields

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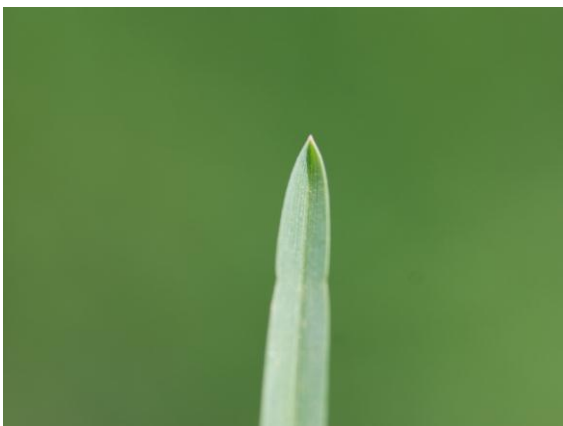
Dr. Aaron Patton

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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



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Poa annua biology

- Seed bank:
 - 110 viable seeds/in² greens
 - 70 viable seeds/in² 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. Dermeoeden. 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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Cultural Control Strategies

- Prevention/Exclusion

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City, TinCaps to replace infested turf

By Chris: Director of The News-Sentinel
Tuesday, March 13, 2012 - 11:41 am

The Fort Wayne TinCaps will need to replace all of Parkview Field's turf this year, costing the team and city tens of thousands of dollars, to rid the field of an unwanted grass that has infested it.

The team discovered the invasive grass, called pig anus, soon after the stadium was first laid ahead of the TinCaps' 2009 debut season. Rick Samek, a lawyer representing the city, told the Fort Wayne Redevelopment Commission on Monday.

"This was just unacceptable in the view of the ball club," Samek said. "We've got a bad situation that's intolerable."

Replacing the turf will cost about \$140,000. The city would pay \$90,000 from a special fund set up to help pay for improvements at Parkview Field, while the team would pitch in the remaining one-third. The commission gave the price its



Latest News

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Cultural Control Strategies

- Irrigation
- N rate
- N timing
- Aerification timing

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CAUTION

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

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Poa annua control in cool-season turf?

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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 (-bispirabac sodium)~~ – Sod and Golf only

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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)

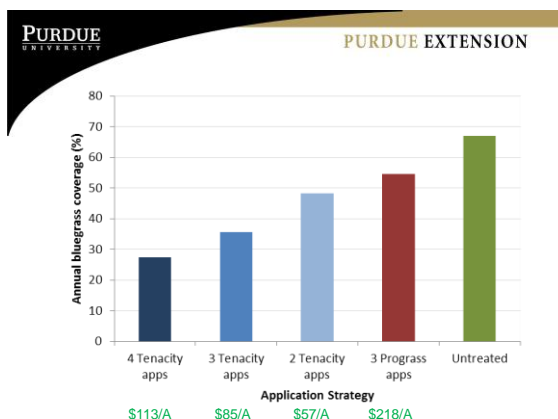
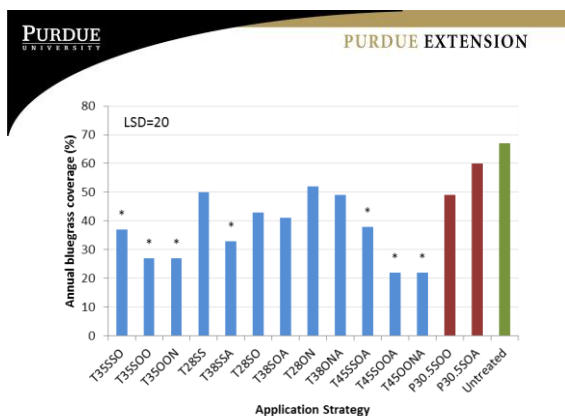




WEEDS CONTROLLED

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

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			



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.

Full Applications of Mesotrione

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PMN Applied Turfgrass Science

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Fall Applications of Mesotrione for Annual Bluegrass Control in Kentucky Bluegrass

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Reicher, Z. J., Weisenberger, D. V., Morton, D. E., Branham, B. E., and Sharp, W. 2011. Fall applications of mesotrione for annual bluegrass control in Kentucky bluegrass. Online. Applied Turfgrass Science doi:10.1094/ATP-2011-0323-01-RS.

Abstract
Annual bluegrass (*Poa annua* L.) is a problematic weed on golf courses, sports turf, and production fields, and irrigated lawns, but few options exist for control of annual bluegrass in Kentucky bluegrass (*Poa pratensis* L.). However, mesotrione has shown promising activity against annual bluegrass and adequate turf safety on Kentucky bluegrass. Experiments were completed from 2004 through 2010 in Urbana, IL, and/or West Lafayette, IN, to refine application strategies for annual bluegrass control with mesotrione in the fall. 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 0.11 and 0.17 kg a.i./ha per application, and follow-up applications in April. Further research will have to improve consistency of *Poa annua* control with mesotrione for

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."*

Tenacity

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



Weeds Controlled

Barnyardgrass	Foxtail, yellow	Pigweed, smooth
Bentgrass, creeping	Galinsoja	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

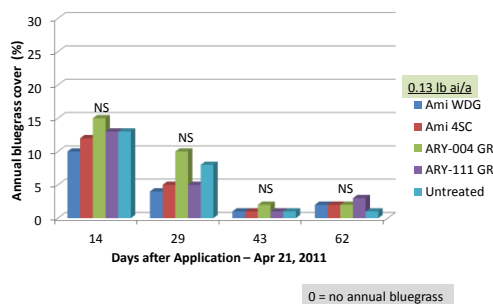
Kentucky bluegrass



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



What about *Poa annua* control in
bermudagrass?



Annual Bluegrass in January



untreated

treated

Annual bluegrass can be competitive as well as unattractive



Poa control in non-overseed bermudagrass

Two approaches

- New chemistry
- Old chemistry
- Also known as



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.

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.

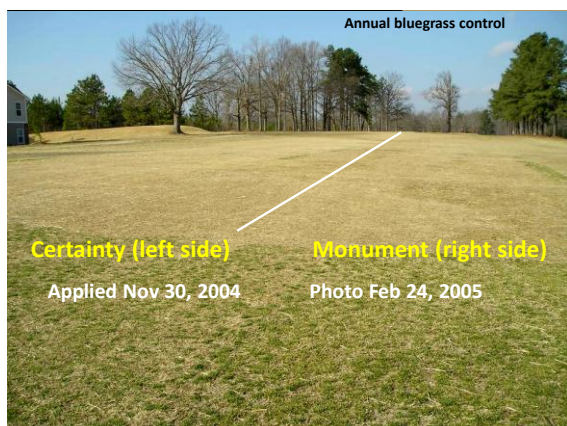
Annual Bluegrass

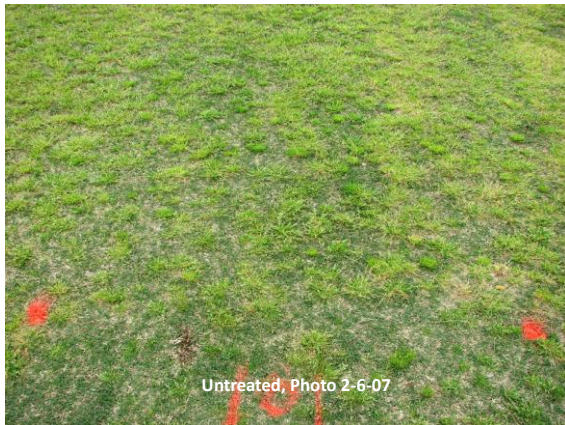
- Simazine or atrazine at 1.0 quart/acre applied in November-December.
- Repeat in February if needed.

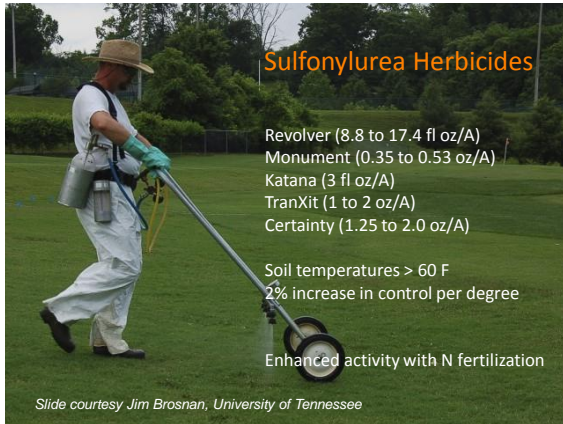


Annual Bluegrass Herbicides

- 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.

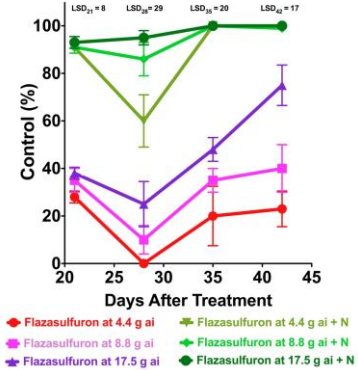






Slide courtesy
Jim Brosnan,
University of
Tennessee

Annual Bluegrass Control in 2009

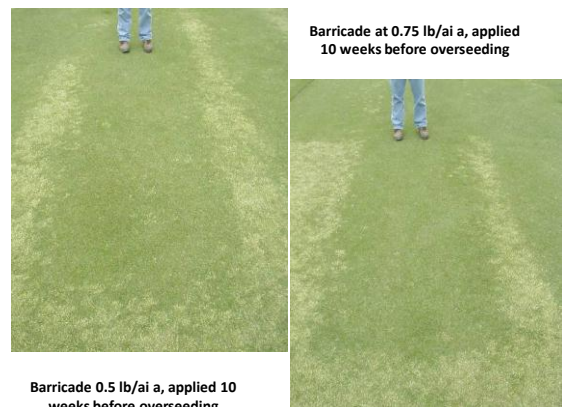


Field Results

- 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



What about *Poa annua* control in
overseeded bermudagrass?





What about using *PGRs*?
Will that work?

PGRs

- Paclobutrazol (Trimmit)
- Flurprimidol (Cutless)
- Flurprimidol + trinexapac-ethyl (Legacy)
- All three (Muskateer)
- Data on putting greens suggest these reduce annual bluegrass sometimes.

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

What new experimental
products are coming?

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?



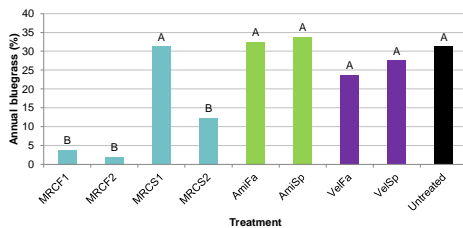
Research Objective - FWY

- 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.

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

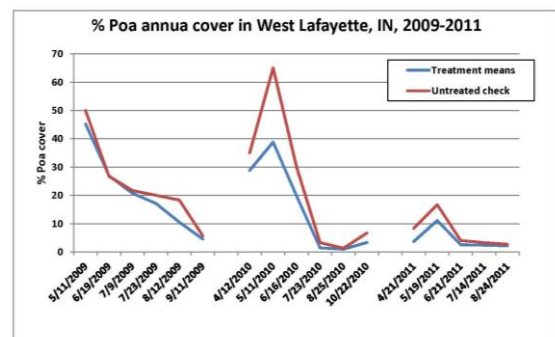
Annual bluegrass cover – 5/25



Conclusions

Things to keep-in-mind with YOUR 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

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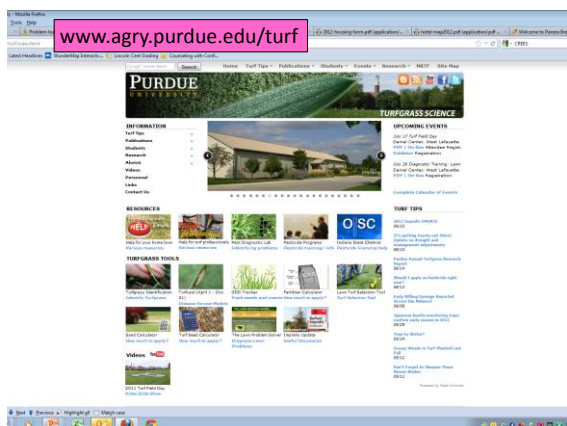
Things to keep-in-mind with YOUR annual bluegrass program

- Stay ahead
- Hardest to control weed on planet?

Things that will survey after nuclear holocaust



Things that will survey after nuclear holocaust



**A New Purdue Weed Control Publication:
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