

Bermudagrass Biotypes and New Weed Problems

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Bermudagrass Biotype Study

- Bermudagrass collected at sugarcane outfield locations and at other sites and used as "mother plants"
- Stolon sections from "mother plants" planted into 2 inch pots in the greenhouse
- Two plants transplanted in center of each 5 x 5 ft plot at the Ben Hur Research Farm
- Areas between plots sprayed with glyphosate using a hooded sprayer to prevent bermudagrass encroachment from adjoining plots

Why? To measure establishment rate, biomass yield, response to frost, and spring regrowth



Bermudagrass Biotypes Evaluated in Greenhouse and Field Experiments

Biotype	Grower	Farm	Location	Parish
----- Outfield Sites (12) -----				
A	Lawrence Levert	St. John	St. Martinville	St. Martin
B	Ronald Hebert	Ronald Hebert	Jeanerette	Iberia
C	Brett Allain	Allain	Baldwin	St. Mary
D	Wilson Judice	Frank Martin	Centerville/Calumet	St. Mary
E	Pete Lanaux	Lanaux	Lucy	St. John
F	Brian Graugnard	Bon Secour	Vacherie	St. James
G	Joel Landry	Glenwood	Napoleonville	Assumption
H	Howard Robichaux	Mary	Raceland	Lafourche
I	Danny Naquin	Magnolia	Schriever	Terrebonne
J	Joe Beard III	Brunswick	Samuels	Point Coupee
K	Todd Andre	Alma	Allon	Point Coupee
L	Al Landry	Landry Farm	Plaquemine	Iberville
----- Off-Station Nursery Site (1) -----				
M	Blake Newton	Bunkie	Bunkie	Avoyelles
----- Other Sites (7) -----				
N	Ronnie Gonsulan	Airport Road	New Iberia	Iberia
O	Ronald Hebert	Bayside	Jeanerette	Iberia
P	Mike Cremaldi	Calumet Cut	Patterson	St. Mary
Q	Kerny Gros	Barrowza Plantation	Port Allen	West Baton Rouge
R	LSU AgCenter	Sugar Res. Station	St. Gabriel	Iberville
S	LSU AgCenter	Dean Lee Res. Stn.	Alexandria	Rapides
T	LSU AgCenter	Northeast Res. Stn.	St. Joseph	Tensas

Bermudagrass Biotype Study

- Biotypes most aggressive:
 - **A** (Lawrence Levert, St. Martinville); **Q** (Kerny Gros, Port Allen); **R** (LSU AgCenter, St. Gabriel)
 - Rapid establishment, tall-growing, long internodes and wide leaves
 - Dry weight 7.8 times greater vs. biotypes **J**, **N**, and **T**
 - Biotypes **A** and **Q** retain green foliage later into winter and initiate growth in spring earlier than some of the other biotypes
- Biotypes least aggressive:
 - **J** (Joe Beaud III, Samuels); **N** (Ronnie Gonsulan, New Iberia); **T** (LSU AgCenter, St. Joseph)
 - Based on ground cover 5.3 times slower to establish vs. biotypes **A**, **Q**, and **R**
 - Plant height 61% less vs. **A**, **Q**, and **R**



August 18, 2011 - 87 DAP

Comparison of Bermudagrass Biotypes

A photograph showing a dense patch of green bermudagrass. The grass blades are relatively short and fine, forming a thick mat. The surrounding area is sandy soil with some sparse grass.

Biotype J (Joe Beaud III; Samuels, LA)

A photograph showing a dense patch of green bermudagrass. The grass blades are significantly longer and more upright than in the top image, creating a taller, more textured appearance. The surrounding area is sandy soil with some sparse grass.

Biotype Q (Kerny Gros; Port Allen, LA)

Bermudagrass Control Study

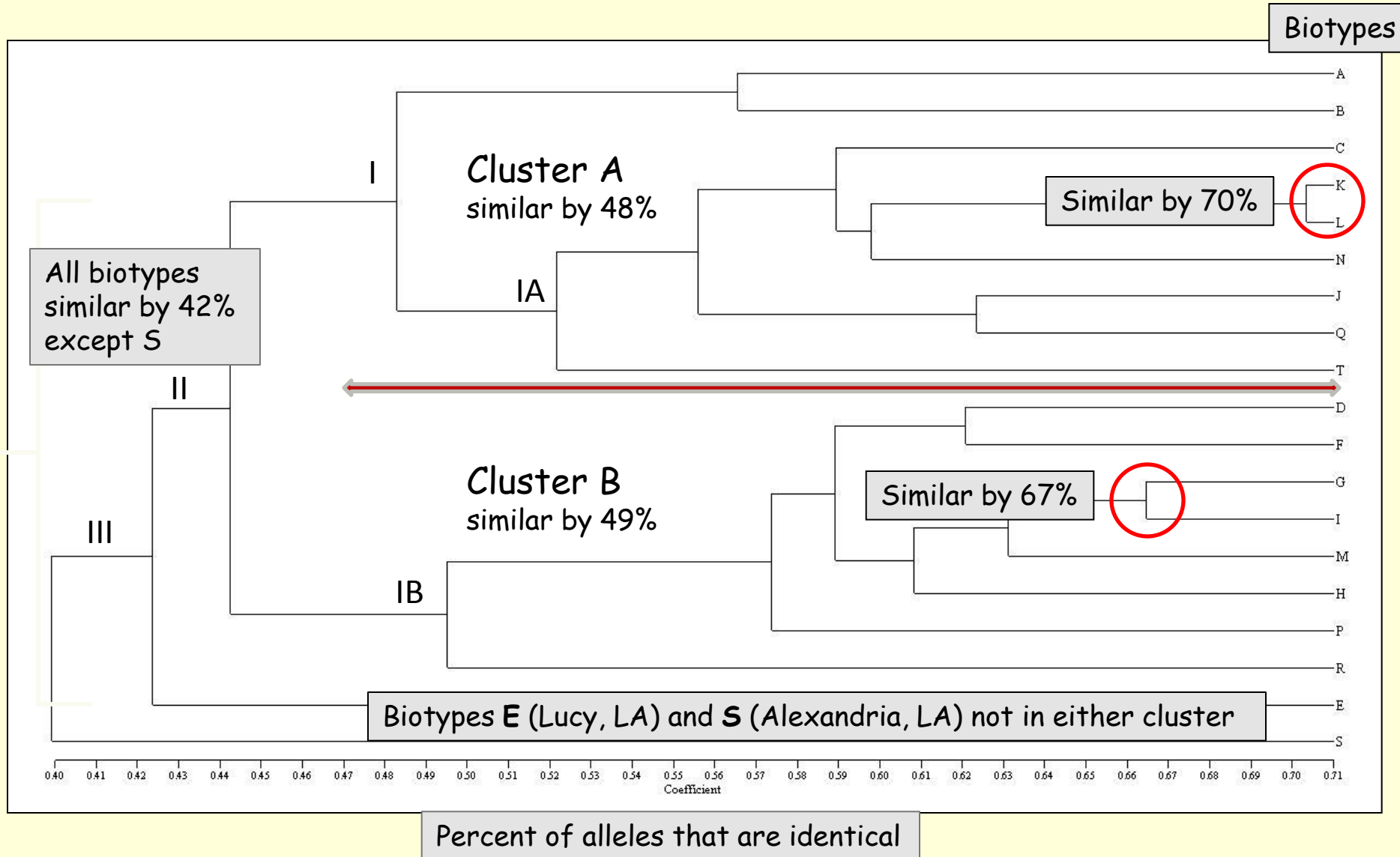
- Bermudagrass biotypes least sensitive to glyphosate based on consistency in control and regrowth response following glyphosate application in both greenhouse and field studies include biotypes **A** (St. Martinville), **C** (Baldwin), and **Q** (Port Allen).
- Bermudagrass biotypes most sensitive to glyphosate based on consistency in response include **D** (Centerville) and **P** (Patterson).



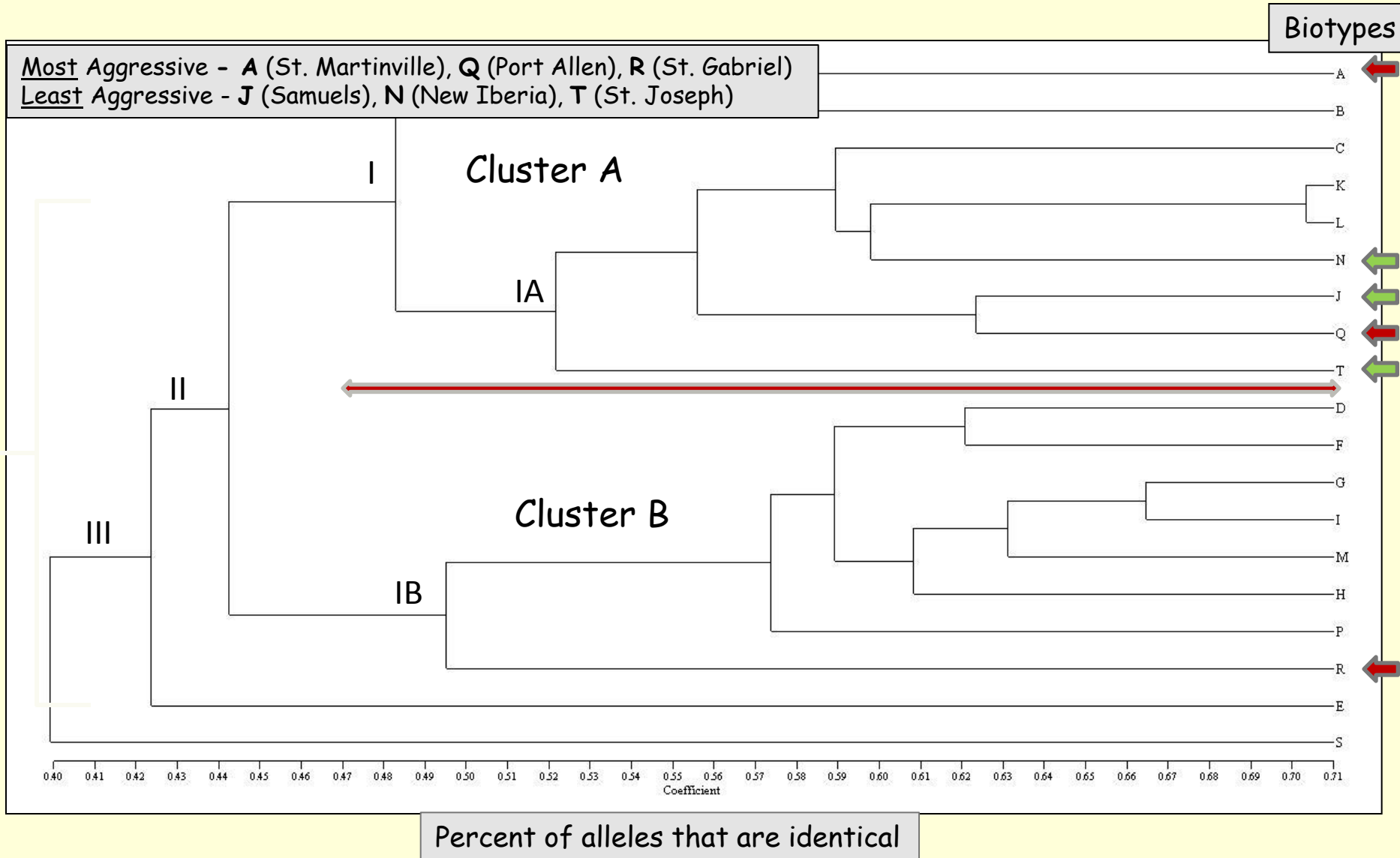
Genetic Diversity of Bermudagrass Biotypes - Dr. Niranjan Baisakh

- DNA extracted from leaf samples of each biotype
- DNA amplification evaluated using 24 RAPD primers
- Amplified bands were scored manually as 1 for presence and 0 for absence in all 19 biotypes
- Pair-wise genetic similarity analyzed
- Resultant matrix employed for cluster analysis and creation of dendrogram (tree) based on UPGMA with the SAHN module

Genetic Sensitivity Index (Dr. Niranjan Baisakh) Based on RAPD (Randomly Amplified Polymorphic DNA)

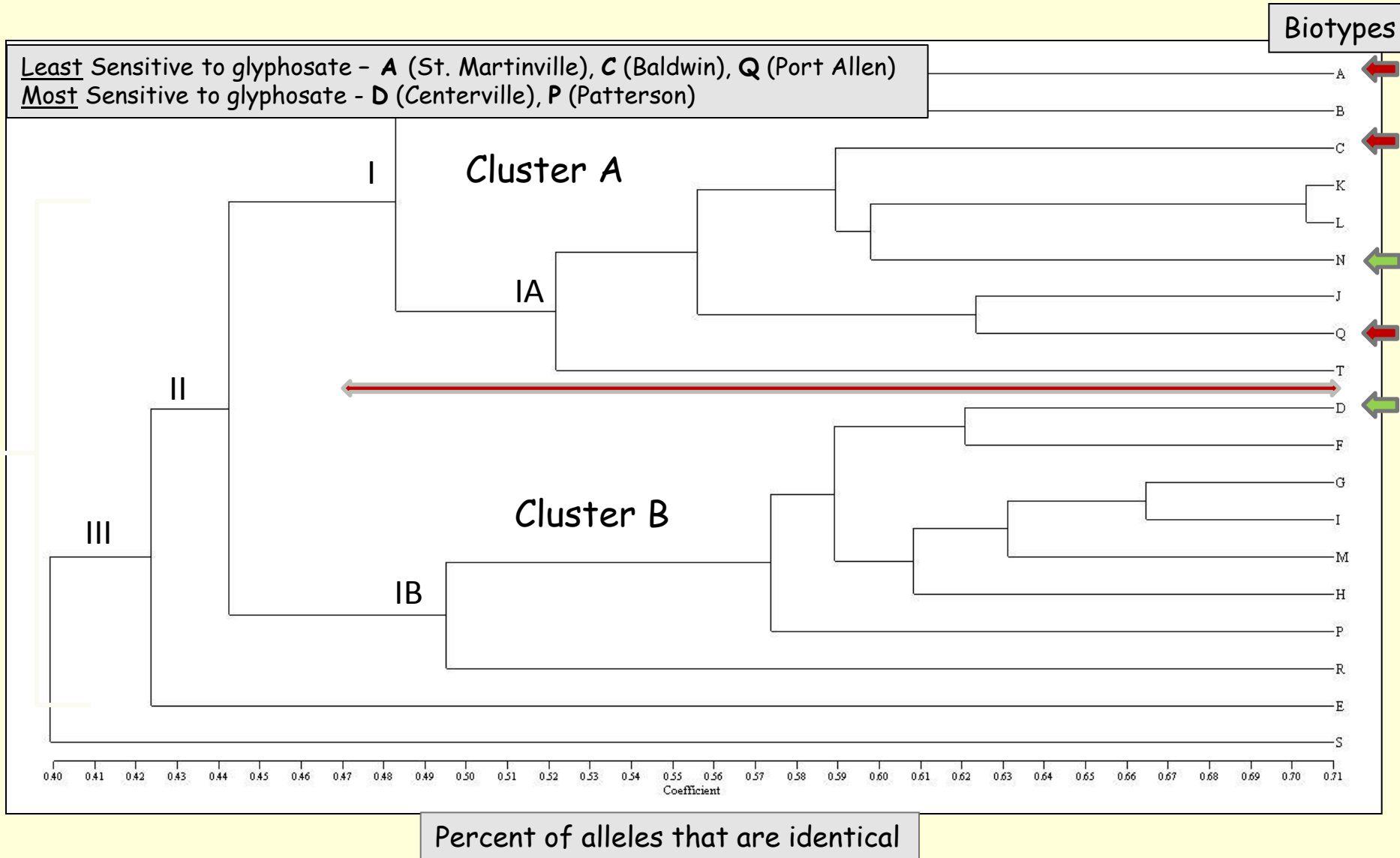


Genetic Sensitivity Index (Dr. Niranjan Baisakh) Based on RAPD (Randomly Amplified Polymorphic DNA)



Genetic Sensitivity Index (Dr. Niranjana Baisakh)

Based on RAPD (Randomly Amplified Polymorphic DNA)



What Does All This Mean?

- Bermudagrass in sugarcane fields in Louisiana is quite variable in morphology, growth habit, and aggressiveness.
- Differences in sensitivity to glyphosate among biotypes may explain variation in bermudagrass control observed in fallowed fields in Louisiana.
- Results suggest that growers consider adjusting control programs in fields where bermudagrass has been more aggressive and competitive with sugarcane.



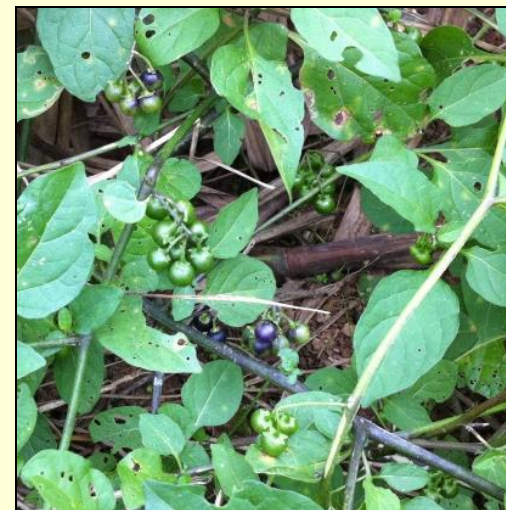
Conclusions

- Attack bermudagrass in fallow with a combination of tillage and glyphosate products.
 - Tillage programs in fallow that fragment bermudagrass stolons and rhizomes prior to glyphosate application should be beneficial.
 - Apply glyphosate when stolon growth is first initiated and before stolons begin to root and spread.
 - Tillage 7 to 10 days following glyphosate application with one or more follow-up applications as needed should help improve long-term bermudagrass control.
- If bermudagrass has been difficult to control in the past:
 - Use an effective herbicide at planting and make a second application 6 to 8 weeks later.
 - Don't skimp on the rate
 - Use cultural practices that promote rapid early season growth of sugarcane to increase crop competition
 - Be aware of variety - those that emerge later in the spring and have an open canopy will encourage bermudagrass re-establishment

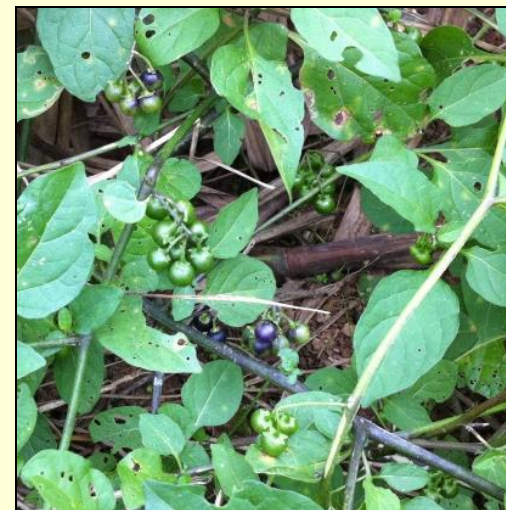
New Weed Problems in Sugarcane



New Weed?



Eastern Black Nightshade



Eastern Black Nightshade

- Plant identified as eastern black nightshade (*Solanum ptycanthum* Dunal)
- Observed in Cheneyville, LA in April 2013
- Common to much of the U.S., but not usually observed in cultivated crops in Louisiana.



Eastern Black Nightshade

Cheneyville, LA April 2013

- Observed large broadleaf plants with flower buds and flowers present and with well-established root systems.
- Large plants appeared to have survived the winter freezes and were at a population dense enough to affect early season sugarcane growth.
- Weedmaster caused twisting and curling of plants, but plants were not killed.
- Weed also observed in other areas of the sugarcane belt; informed that atrazine and metribuzin products were ineffective on established plants.



Eastern Black Nightshade

Cheneyville, LA April 2013

- Plants upright growing with distinctive leaf shape and red-purple coloration on lower leaf surface.
- Flowers white and star-shaped.
- Fruit a round berry green, purplish black or dark green at maturity; each berry can produce 50-100 seeds.
- Generally considered an annual weed, but also can be a short-lived perennial in mild climates where plants survive the winter.
- The perennial nature of eastern black nightshade can explain what was observed in sugarcane fields in April.



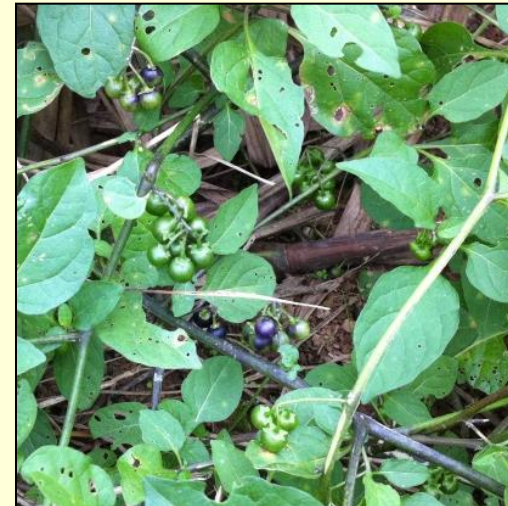
Eastern Black Nightshade

- Why it is just now showing up in sugarcane fields?
- The weed may have been present all along but at a very low population level where it was not a concern.
- With seed production potential of 50 to 100 seed per berry, it would not take long for a light population to become a heavy population.
- It has been documented that eastern black nightshade seed can be spread by birds, but the infestation level that I have seen is too widespread for that to be the only explanation for its presence.
- Most weed seed have a strong dormancy mechanism which allows them to persist in soil for many years.
- Environmental conditions such as wetting and drying of soil and alternating cool and warm temperatures as well as internal processes in the seed may have caused seed to break dormancy which may account for the increased presence.

Eastern Black Nightshade

Cheneyville, LA - November 2013

- Cheneyville sites revisited on November 12.
- A few large plants with fruit/berries present on the ends of sugarcane rows that had not been harvested.
- A heavy population of 3- to 10-leaf plants present in sugarcane planted following soybeans.
- Question? Will plants be able to survive the winter?



Control Recommendation?

- For eastern black nightshade not killed by frost, apply 2,4-D plus dicamba (Weedmaster/Brash/Latigo/ others) or dicamba alone (Clarity/Visio/ /others) in December, January, or early February when plants are small and actively growing rather than in March or April.
- This should eliminate early season competition with sugarcane.
- Current status?



New Weed?



Ragweed parthenium



Ragweed parthenium (*Parthenium hysterophorus* L.)

- Is not a "ragweed" like common or giant ragweed (*Ambrosia* spp.)
- Member of Asteraceae Family
- Summer annual
- Coarse, upright growing 12-40 in tall
 - Leaves can be 4-8 inches long and are deeply lobed.
 - Each flower head which only reaches 3/16 inch in diameter consists of 5 white ray flowers and numerous disk flowers.
 - Blooms from August to December.
 - Flowers produce an abundance of pollen, making it a major hay-fever plant.



Ragweed parthenium

(Parthenium hysterophorus L.)

- Movement

- Spread by seed, with each plant producing an average of 2,400-30,000 seeds.
- Dispersal is thought to be mainly mechanical on animals and equipment, in fodder and grain, with nursery plants, with flowing water, and, to a limited extent, via wind.
- Seeds may remain viable for 2-6 years.

- Adaptability

- Drought-tolerant plant and can grow in almost all soil types and over a wide range of moisture and temperature conditions
- Reportedly photoperiod and thermoperiod insensitive and can flower year-round.
- Can be very competitive

Ragweed Parthenium in Sugarcane

- Common on roadsides, ditchbanks, and ends of sugarcane rows
- In crops, does not appear to tolerate tillage and heavy shade
- 2,4-D, 2,4-D plus atrazine, atrazine, dicamba, and metribuzin have been shown effective
- Contact me if you find situations where ragweed parthenium is negatively affecting sugarcane.



Questions?

IF YOU
CAN READ
THIS
YOU'RE
IN RANGE

A photograph of a rural farm scene. In the foreground, a wooden fence post supports a black sign with white text that reads "IF YOU CAN READ THIS YOU'RE IN RANGE". The fence is made of wire and a wooden post. In the background, there are several large, round hay bales stacked together. A stream or small river flows through the scene, and the surrounding area is filled with bare, leafless trees, suggesting a late autumn or winter setting. The ground is covered with dry grass and patches of snow.

Questions?





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■ Mainland Distribution of *Parthenium hysterophorus*
□ Islands where *Parthenium hysterophorus* is present



Winter Weed Control – 21 DAT (Avg. 4 Experiments)

Treatment	Rate/A	Italian	Spotted	Purslane	Spiny
		ryegrass	burclover	speedwell	sowthistle
		2 – 24"	6 – 14"	1 - 3"	4 – 24"
----- % -----					
Atrazine	2 qt	2 cd	32 d	77 bc	29 f
Direx	3 lb	20 b	35 d	52 d	33 f
Dupont K4	4 lb	16 b	41 cd	74 c	49 de
Sencor	2 lb	8 bcd	39 cd	84 abc	46 e
Weedmaster	1 qt	14 bcd	68 b	89 a	63 abc
WM + atrazine	1 qt + 2 qt	15 bc	71 ab	85 ab	68 a
WM + Direx	1 qt + 3 lb	14 bcd	81 ab	86 ab	68 a
WM + Duont K4	1 qt + 4 lb	18 b	69 b	87 ab	70 a
WM + Sencor	1 qt + 2 lb	8 bcd	69 b	89 a	69 a
Gramoxone Inteon	2.5 pt	92 a	51 c	86 ab	48 e
GI + atrazine	2.5 pt + 2 qt	84 a	68 b	90 a	56 cde
GI + Direx	2.5 pt + 3 lb	89 a	67 b	87 ab	57 bcde
GI + Dupont K4	2.5 pt + 4 lb	90 a	77 ab	86 ab	61 abcd
GI + Sencor	2.5 pt + 2 lb	93 a	72 ab	88 ab	67 abc
WM + Gramoxone	1 qt + 2.5 pt	91 a	84 a	87 ab	70 a
Nontreated		0 d	0 e	0 e	0 g

Weed Problems in Sugarcane



Doveweed

Murdannia nudiflora

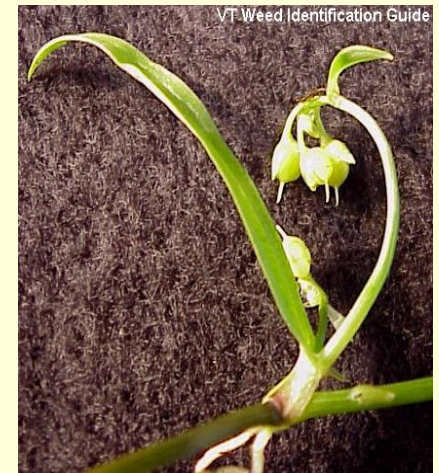
- Monocot (not a grass or a broadleaf plant)
- Member of dayflower family and poorly controlled with glyphosate
- Creeping stems with roots at nodes
- Purple or blue flowers
- Problem in fallowed sugarcane fields
- Dense mat on the row can interfere with opening at planting
- Not competitive with sugarcane



Doveweed

Murdannia nudiflora

- Roundup WeatherMax @ 70 oz – 43% control
- Weedmaster @ 6 pt – 53% control
- Valor @ 3 oz – 79% control
- Sencor @ 2 lb – 75% control
- Atrazine, Direx, Envoke, and Aim – 21 to 60% control
- Gramoxone Inteon @ 1.5 qt/A + 1% COC – 90% control
- Gramoxone Inteon @ 0.75 qt/A + 1% COC – 60-70% control



Doveweed

Murdannia nudiflora



"Shandon" / Browntop Millet

Urochloa ramosa

- Synonyms: *Brachiaria ramosa* or *Panicum ramosum*
- Annual weed problem in fallowed sugarcane fields and in-crop in southern parishes
- Problem where Sencor is used
- Roundup not effective on large established plants
- Closely related to broadleaf signalgrass



“Shandon” / Browntop Millet

Brachiaria ramosa

- A spreading summer annual that can grow erect or prostrate along the ground with tips ascending (decumbent growth habit).
- Leaf blades are short and widest near the base and taper to the apex. Leaves are rolled in the bud and without hairs on either leaf surface except on margins and in the collar region. The ligule is fringed with hairs.
- Nodes along the stem are minutely to shortly hairy, and *leaf sheaths are without hairs*. Sheath margins may be hairy



Least Snout-Bean

Rhynchosia minima

- Fabaceae family
- Perennial legume with vining growth habit
- Produces woody rhizomes
- 2,4-D and Weedmaster not effective on vining plants
- Problem in standing cane
- Thought initially to be a *Desmodium* spp. (Florida beggarweed-like)



Least Snout-Bean *Rhynchosia minima*

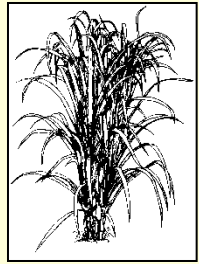


For 2010?



**May be a rough start but
with a little planning and hard work
you can meet the challenge!**

Questions??

















Questions??

- New weed problems - Lesser snout bean and Shandon (millet)
- Burning down ryegrass and rescuegrass (Sencor not applied in fall)
 - Ryegrass taller than usual and dead growth from the newly planted cane is present; What to do?
 - Shred dead growth and spray (weed foliage is removed affecting coverage of weeds)
 - Spray first (dead growth will cover ryegrass, preventing contact; how much gramoxone will actually reach the weeds)
 - Burn - will the fire kill rye/rescue waiting under these strips? **Fire will not provide 100% control of winter weeds; get residue off now and worry about weeds later**
- What sort of post activity can one expect from Sencor, Direx, Atrazine, Velpar, etc. if a crop oil is added?
- Which broadleaf weeds will require phenoxies added to the pre/post herbicides? with gramoxone.