HERBICIDE AND WEED CONTROL UPDATE

AUGUSTA AND ROCKINGHAM COUNTIES

JANUARY 13, 2014

SCOTT HAGOOD, VIRGINIA TECH

VT Weed Science Web Page

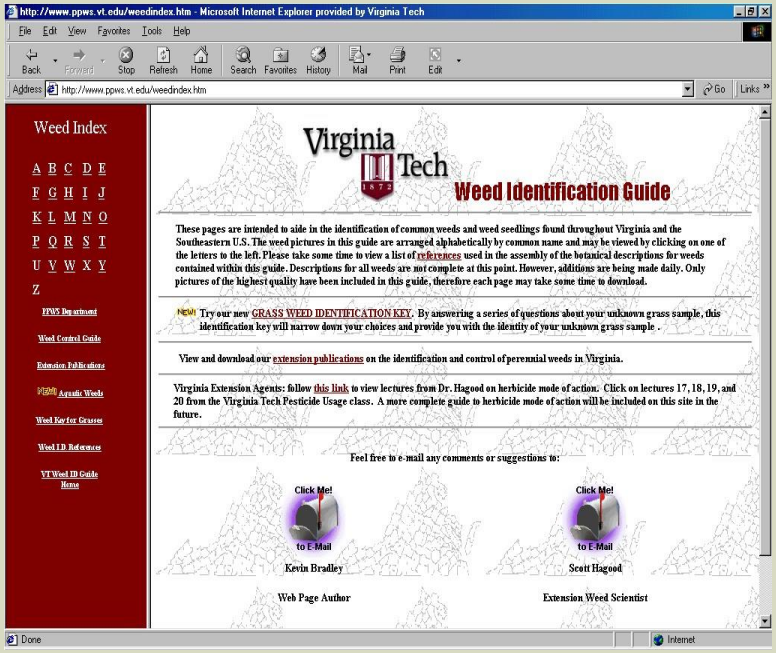
WEED ID GUIDE

AQUATIC WEEDS

E-MAIL ACCESS TO SPECIALISTS

EXTENSION PUBLICATIONS

- HONEYVINE MILKWEED
- HORSENETTLE
- TRUMPETCREEPER
- HEMP DOGBANE
- ANNUAL RYEGRASS
- MUGWORT
- COMMON PASTURE/HAYFIELD WEEDS
- ITCHGRASS



HERBICIDE MODE OF ACTION - WEED RESISTANCE

DIAGNOSTICS VIA DIGITIZED IMAGES

ACCESS TO ALL 2014 PEST MANAGEMENT GUIDES (~JANUARY 2014)

~1,200 EXTERNAL SITES LINK TO THIS VT SITE

~8,000,000 “HITS” ANNUALLY

GLYPHOSATE - MYTHS AND REALITIES

Verona and Dayton, Virginia
March 19, 2013

Scott Hagood
Department Plant Pathology, Physiology and Weed Science
Virginia Tech

NaturaLawn of America

THE LEADER IN ORGANIC-BASED LAWN CARE

NCAP

Northwest Coalition for Alternatives to Pesticides

Protecting people and the environment by advancing healthy solutions to pest problems

Advancing alternatives to pesticides worldwide

ToxicAlert™

Pesticide Action Network NORTH AMERICA

PESTICIDE FREE ZONE

Art: Joe Draeghert

BEYOND PESTICIDES

NATIONAL COALITION AGAINST THE … BECAUSE FREEDOM FRO… RIGHT

Minnesota Pollution Control Agency Kids

Hendrikus Schrimpe Organics

Soils

Fertilizers

Soil Amendments

BEYOND PESTICIDES
Protecting Health and the Environment with Science, Policy and Action

10 Reasons to Say No to Genetically Engineered Crops and Foods

1. Insect Resistance

Most genetically engineered (GE) crops are either engineered to produce their own pesticide in the form of *Bacillus thurengiensis* (Bt) or are engineered to be resistant to herbicides, which include "Roundup-Ready" crops. Bt is used by organic farmers as a least-toxic alternative to control bugs. Organic farmers use Bt sparingly and only as a last resort, but thousands of acres of GE crops contain Bt. It's only a matter of time before insects become resistant to Bt, some scientists say as little as 3-5 years. Then organic farmers will be left without this important tool. "Roundup-Ready" crops allow farmers to spray their fields with the herbicide RoundupTM (glyphosate) without harming the herbicide resistant crop. This practice has led to increased use of glyphosate and insect resistance to the herbicide.

BEYOND PESTICIDES
Protecting Health and the Environment with Science, Policy and Action

10 Reasons to Say No to Genetically Engineered Crops and Foods

2. Superweeds

Herbicide resistant crops have been shown to cross-pollinate with weeds in the same family, creating super-weeds that are also resistant to herbicides. This will lead to ineffective increased herbicide use because farmers will spray the superweeds repeatedly, unaware that the weeds are herbicide-resistant. Also, weeds that have cross-pollinated with GE crops bred to resist insect may become invasive, spreading beyond their natural habitat and out-competing native plants.

Researcher: Roundup or Roundup-Ready Crops May Be Causing Animal Miscarriages and Infertility

One of the nation's senior scientists alerted the federal government to a newly discovered organism that may have the potential to cause infertility and spontaneous abortion in farm animals, raising significant concerns about human health. Dr. Don Huber, professor emeritus at Purdue University, believes the appearance and prevalence of the unnamed organism may be related to the nation's over reliance on the weed killer known as Roundup and/or to something about the genetically engineered Roundup-Ready crops. In a letter to Secretary of Agriculture Tom Vilsack, the professor called on the federal government to immediately stop deregulation of roundup ready crops, particularly roundup ready alfalfa.

January 16, 2011

Dear Secretary Vilsack:

A team of senior plant and animal scientists have recently brought to my attention the discovery of an electron microscopic pathogen that appears to significantly impact the health of plants, animals, and probably human beings. Based on a review of the data, it is widespread, very serious, and is in much higher concentrations in Roundup Ready (RR) soybeans and corn—suggesting a link with the RR gene or more likely the presence of Roundup. This organism appears NEW to science!

This is highly sensitive information that could result in a collapse of US soy and corn export markets and significant disruption of domestic food and feed supplies. On the other hand, this new organism may already be responsible for significant harm (see below). My colleagues and I are therefore moving our investigation forward with speed and discretion, and seek assistance from the USDA and other entities to identify the pathogen's source, prevalence, implications, and remedies.

We are informing the USDA of our findings at this early stage, specifically due to your pending decision regarding approval of RR alfalfa. Naturally, if either the RR gene or Roundup itself is a promoter or co-factor of this pathogen, then such approval could be a calamity. Based on the current evidence, the only reasonable action at this time would be to delay deregulation at least until sufficient data has exonerated the RR system, if it does.

For the past 40 years, I have been a scientist in the professional and military agencies that evaluate and prepare for natural and manmade biological threats, including germ warfare and disease outbreaks. Based on this experience, I believe the threat we are facing from this pathogen is unique and of a high risk status. In layman's terms, it should be treated as an emergency.

A diverse set of researchers working on this problem have contributed various pieces of the puzzle, which together presents the following disturbing scenario:

Unique Physical Properties

This previously unknown organism is only visible under an electron microscope (36,000X), with an approximate size range equal to a medium size virus. It is able to reproduce and appears to be a micro-fungal-like organism. If so, it would be the first such micro-fungus ever identified.

There is strong evidence that this infectious agent promotes diseases of both plants and mammals, which is very rare.

THE ORGANIC & NON-GMO REPORT

Scientist warns of dire consequences with widespread use of glyphosate

The December/January 2010 issue of The Organic & Non-GMO Report *featured an interview with Robert Kremer, an adjunct professor in the Division of Plant Sciences at the University of Missouri, whose research showed negative environmental impacts caused by glyphosate, the main ingredient in Monsanto's Roundup herbicide, which is used extensively with Roundup Ready genetically modified crops.*

The following interview is with another scientist, Don Huber, who recently retired from Purdue University, who has also documented negative environmental impacts from glyphosate.

The widespread use of glyphosate is causing negative impacts on soil and plants as well as possibly animal and human health. These are key findings of Don Huber, emeritus professor of plant pathology, Purdue University.

THE ORGANIC & NON-GMO REPORT

Please tell me about your research with glyphosate.

Don Huber: I have been doing research on glyphosate for 20 years. I began noticing problems when I saw a consistent increase in 'take-all' (a fungal disease that impacts wheat) where glyphosate had been applied in a previous year for weed control. I tried to understand why there was an increase in disease with glyphosate.

I found that glyphosate has an effect on reducing manganese in plants, which is essential to many plant defense reactions that protect plants from disease and environmental stress. Glyphosate can immobilize plant nutrients such as manganese, copper, potassium, iron, magnesium, calcium, and zinc so they are no longer nutritionally functional.

Glyphosate kills weeds by tying up essential nutrients needed to keep plant defenses active. **Glyphosate doesn't kill weeds directly but shuts down their defense mechanisms so pathogens in the soil can mobilize and kill the weeds.** Glyphosate completely weakens the plant, making it susceptible to soil borne fungal pathogens. That is one reason why we see an increase in plant diseases. Glyphosate causes plants to be more susceptible and greatly stimulates the virulence of pathogens that kill plants.

Glyphosate's Impact on Field Crop Production and Disease Development

PURDUE UNIVERSITY

Overall, the claims that glyphosate is having a widespread effect on plant health are largely unsubstantiated. To date, there is limited scientific research data that suggest that plant diseases have increased in GM crops due to the use of glyphosate. Most importantly, the impact of these interactions on yield has not been demonstrated. Therefore, we maintain our recommendations of judicious glyphosate use for weed control. **We encourage crop producers, agribusiness personnel, and the general public to speak with University Extension personnel before making changes in crop production practices that are based on sensationalist claims instead of facts.**

Glyphosate – Manganese Interactions and Impacts on Crop Production: The Controversy

PURDUE UNIVERSITY

We have been getting many phone calls concerning the recent No-Till Farmer article 'Are We Shooting Ourselves in the Foot with the Silver Bullet?' (http://fhrfarms1.com/notillglyphosate.pdf). In this article based on an interview with Dr. Don Huber (retired plant pathologist from Purdue University), it is alleged that the non-judicious use of glyphosate has induced micronutrient deficiencies which have led to more plant disease.

Yield reductions can occur when Mn is applied to soybean not needing Mn, so 'insurance' applications of Mn are not recommended. **Routine applications of Mn or other micronutrients to alleviate the alleged impacts of glyphosate on plant disease are also not warranted. Glyphosate applications should be managed to avoid weed resistance.**

Iowa State University Extension Department of Agronomy
Glyphosate-Manganese Interactions in Roundup Ready Soybean

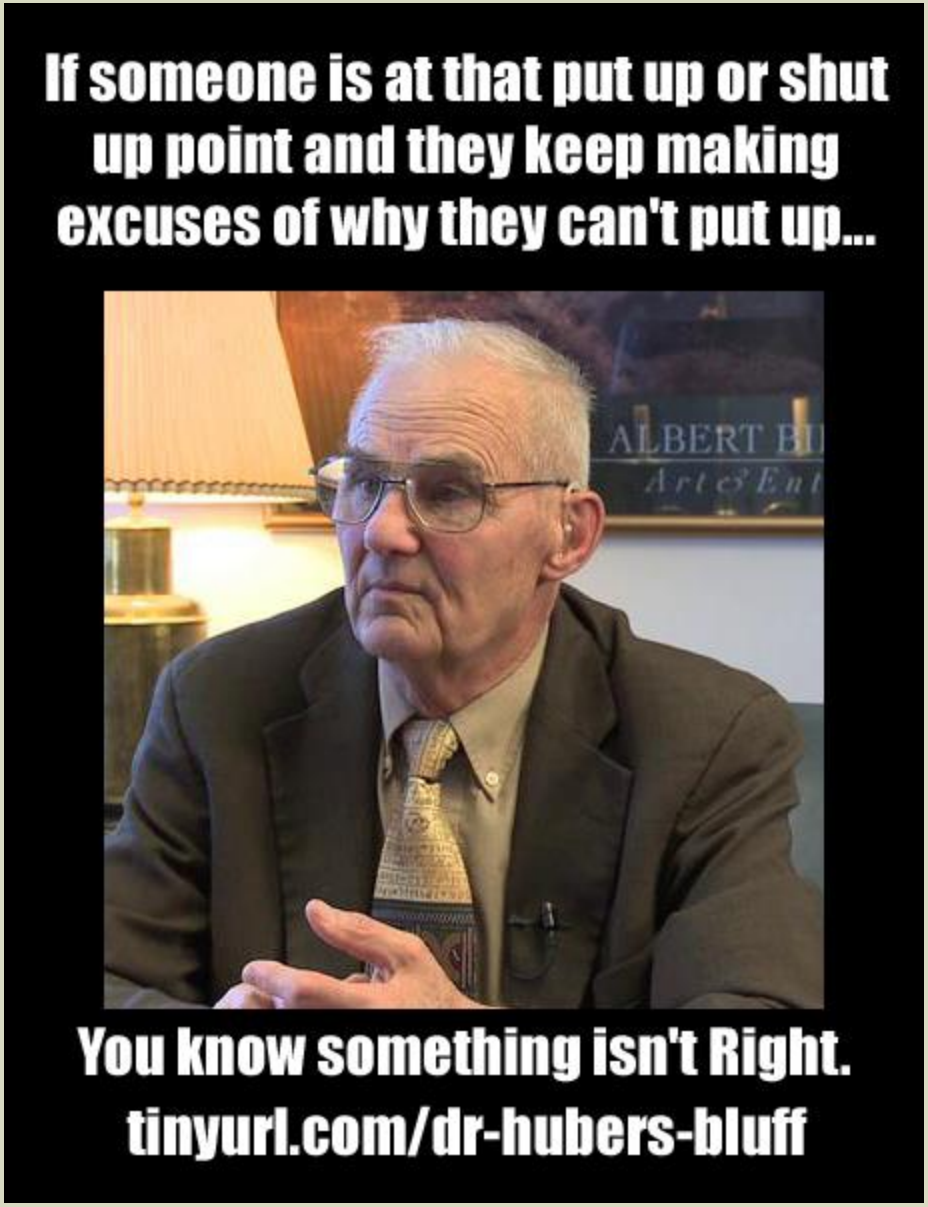
Summary

So the question is whether RR soybean varieties require different Mn management practices than conventional varieties and if this is really a problem under Iowa conditions. Glyphosate is known to form complexes with Mn and other metal cations that may reduce both the availability of the cation and glyphosate activity. However, most interactions between RR soybean and Mn have been observed in areas with soils known to be deficient in Mn. Although there has been research indicating RR soybean may respond differently to Mn than conventional varieties, the majority of research does not support this observation. **The best recommendation remains to manage RR soybean similar to conventional varieties in terms of fertility management.**

BIOLOGY FORTIFIED

Dr. Huber turns down my generous offer
By Dr. Kevin Folta on November 13, 2013

Here's what happened
"I offer to sequence the genome of the pathogen and identify what it is," I said. "If Dr. Huber could kindly give me a small amount of the culture we could identify this new life form before Christmas."




Easy to Handle
Easy to Pour
Roundup
POWERMAX
CAUTION!
Roundup PowerMAX

2014 PMG REVISIONS – CORN

- Basis Blend preemergence entry (rimsulfuron + thifensulfuron-methyl) for control of triazine resistant species.
- MicroTech (alachlor) to Intrro.
- Keystone formulation changes.
- Instigate preemergence entry (rimsulfuron + mesotrione) for initial residual control in a planned two pass program.

EFFECTIVENESS OF "BURNDOWN" HERBICIDE PROGRAMS FOR CONSERVATION TILLAGE IN VIRGINIA

TREATMENT	BROADLEAF WEEDS	ANNUAL GRASSES	CEREAL COVER CROPS (VEG)	CEREAL COVER CROPS (REP)	MARESTAIL OR HORSEWEED	ANNUAL RYEGRASS	COOL SEASON PERENNIAL SODS
GRAMOXONE	G	G	G	G	F	P–F	G*
LIBERTY	G	F–G	F	P	F–G	P	F–G*
ROUNDUP	G	G	G	F	G (SUSC) N (RES)	F–G	G**
SHARPEN	G	N	N	N	G	N	N

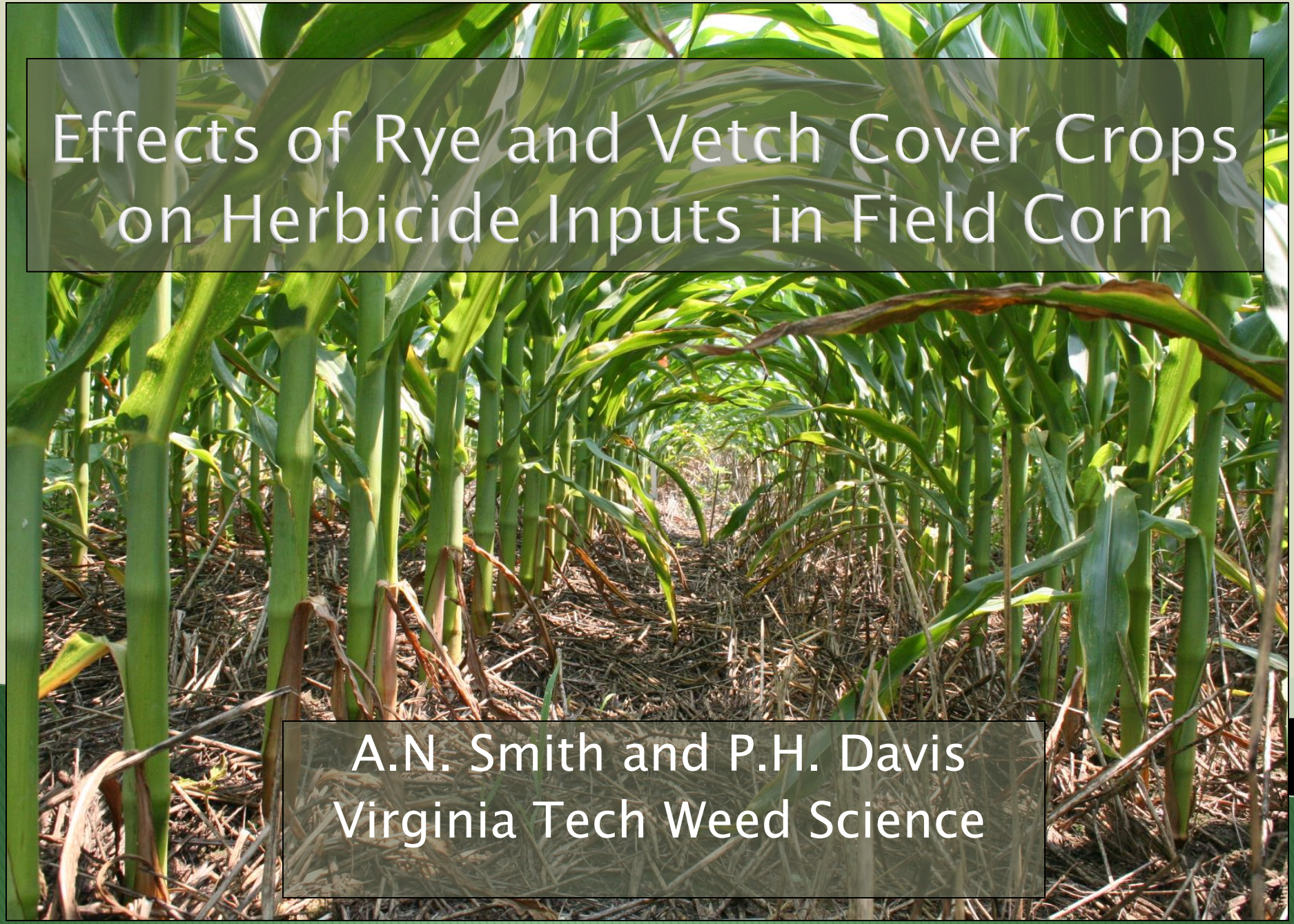
* REQUIRES SEQUENTIAL APPLICATIONS
** REQUIRES HIGHER APPLICATION RATES

Residual Weed Control Preemergence Salflufenacil

Table 2. Broadleaf Weeds Controlled with a Residual Preemergence Application of Sharpen™ herbicide

Common Name	Scientific Name	C = Control S = Suppression[1]
Annual Broadleaf Weeds		
Amaranth, Palmer	*Amaranthus palmeri*	C
Amaranth, Powell	*Amaranthus powellii*	C
Beggarweed, Florida	*Desmodium tortuosum*	C
Buckwheat, wild	*Polygonum convolvulus*	C
Burcucumber	*Sicyos angulatus*	S
Carpetweed	*Mollugo verticillata*	C
Chickweed, common	*Stellaria media*	C
Cocklebur, common	*Xanthium strumarium*	C
Copperleaf, Virginia	*Acalypha virginica*	C
Galinsoga, smallflower	*Galinsoga parviflora*	C
Groundcherry, cutleaf	*Physalis angulata*	C
Horseweed (marestail)	*Conyza canadensis*	C
Jimsonweed	*Datura stramonium*	C
Kochia	*Kochia scoparia*	C
Ladysthumb	*Polygonum persicaria*	C
Lambsquarters, common	*Chenopodium album*	C
Mallow, Venice	*Hibiscus trionum*	C
Marestail (horseweed)	*Conyza canadensis*	C
Morningglory, entireleaf	*Ipomoea hederacea* var. *integriuscula*	C
Morningglory, ivyleaf	*Ipomoea hederacea*	C
Morningglory, pitted	*Ipomoea lacunosa*	C
Morningglory, tall	*Ipomoea purpurea*	C
Mustard, wild	*Sinapis arvensis*	C
Nightshade, black	*Solanum nigrum*	C
Pennycress, field	*Thlaspi arvense*	C
Pigweed, prostrate	*Amaranthus blitoides*	C
Pigweed, redroot	*Amaranthus retroflexus*	C
Pigweed, smooth	*Amaranthus hybridus*	C
Pigweed, tumble	*Amaranthus albus*	C
Puncturevine	*Tribulus terrestris*	S
Purslane, common	*Portulaca oleracea*	C
Pusley, Florida	*Richardia scabra*	S
Ragweed, common	*Ambrosia artemisiifolia*	C
Ragweed, giant	*Ambrosia trifida*	C
Sida, prickly	*Sida spinosa*	C
Smartweed, Pennsylvania	*Polygonum pensylvanicum*	C
Starbur, bristly	*Acanthospermum hispidum*	C
Sunflower, common	*Helianthus annuus*	C
Thistle, Russian	*Salsola kali*	C
Velvetleaf	*Abutilon theophrasti*	C
Waterhemp	*Amaranthus tuberculatus*	C

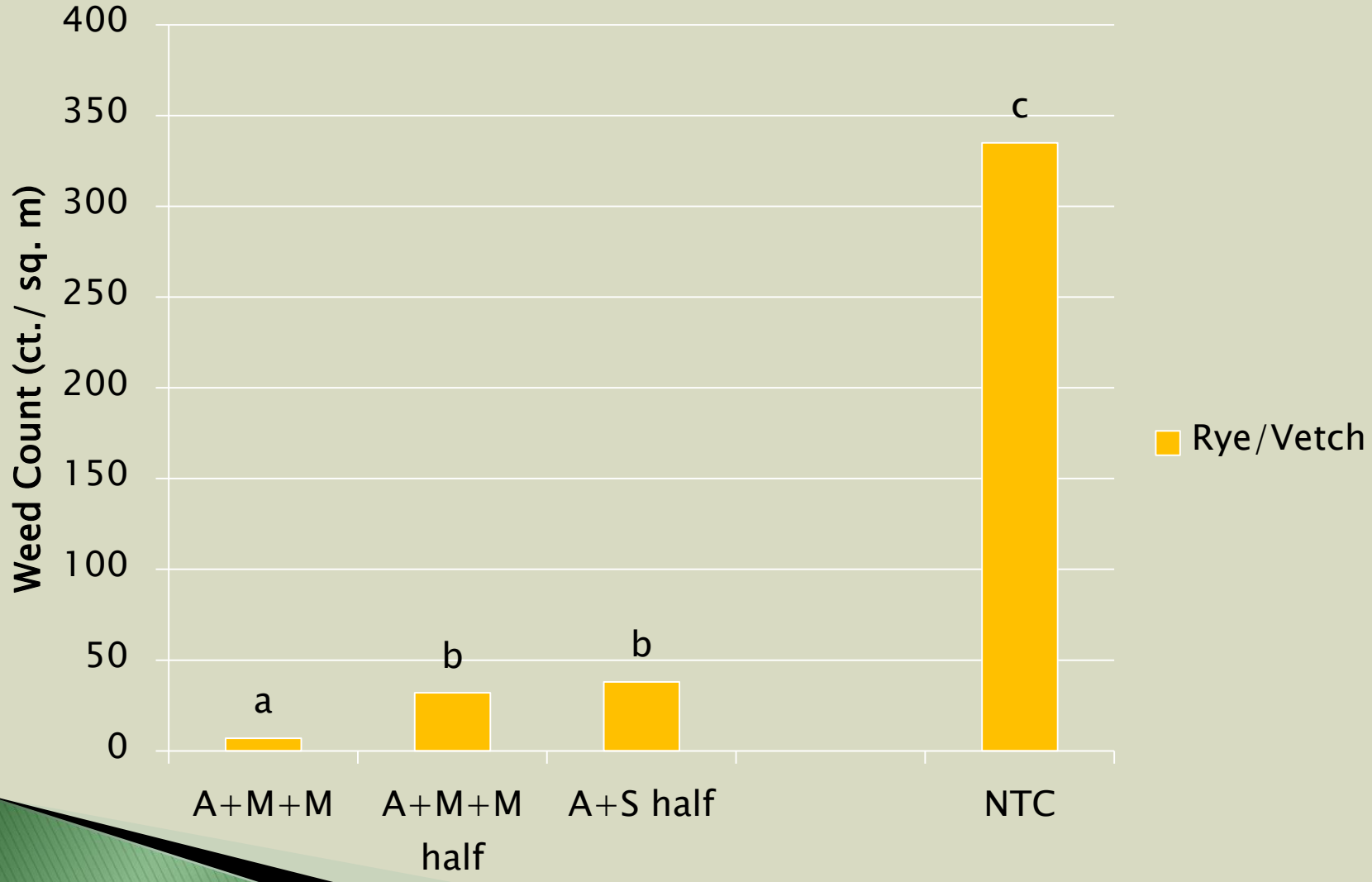
[1] **Sharpen** should be used in tank mixes or sequential applications with other labeled herbicides that provide additional control of noted weeds.



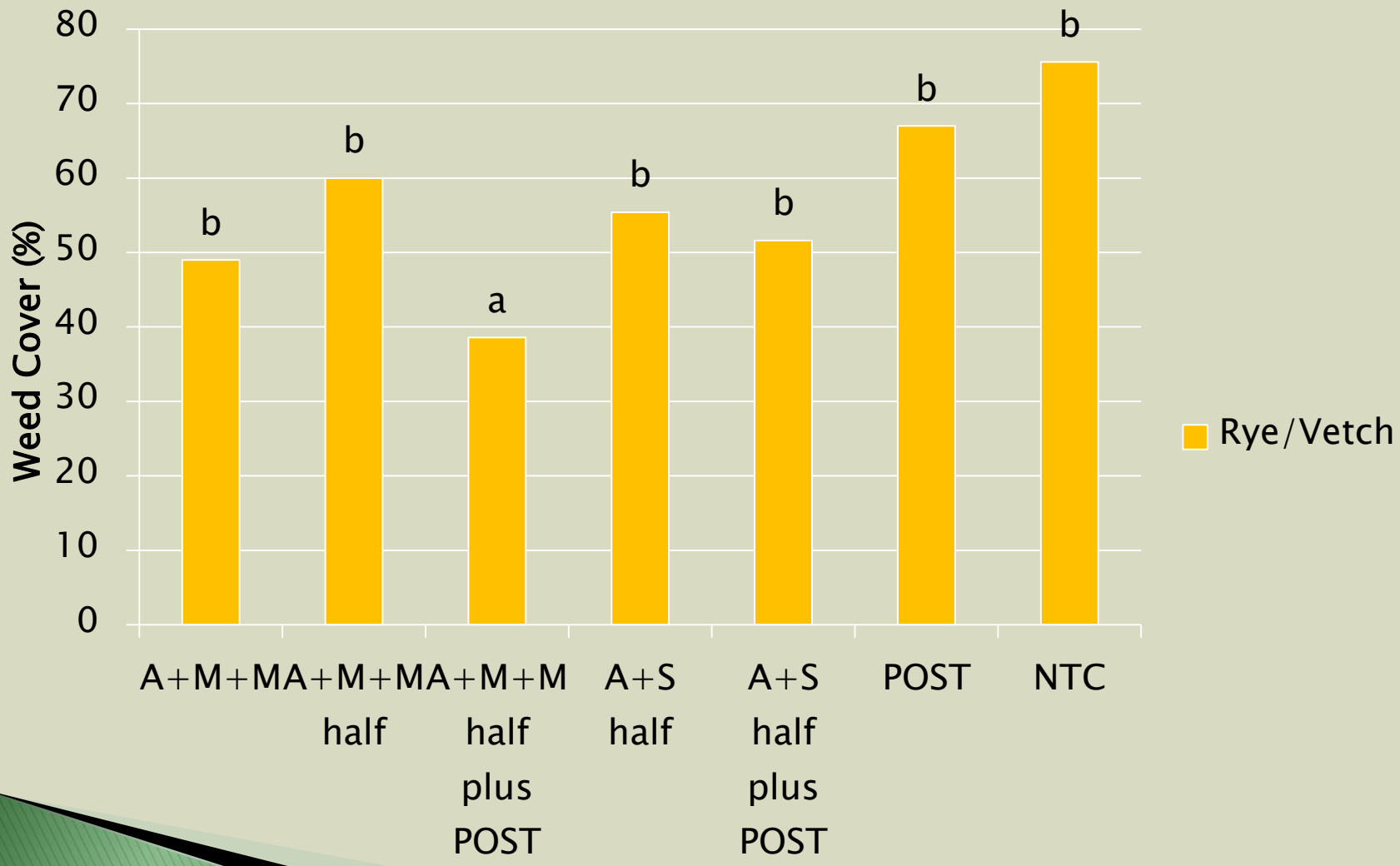
Effects of Rye and Vetch Cover Crops on Herbicide Inputs in Field Corn

A.N. Smith and P.H. Davis
Virginia Tech Weed Science

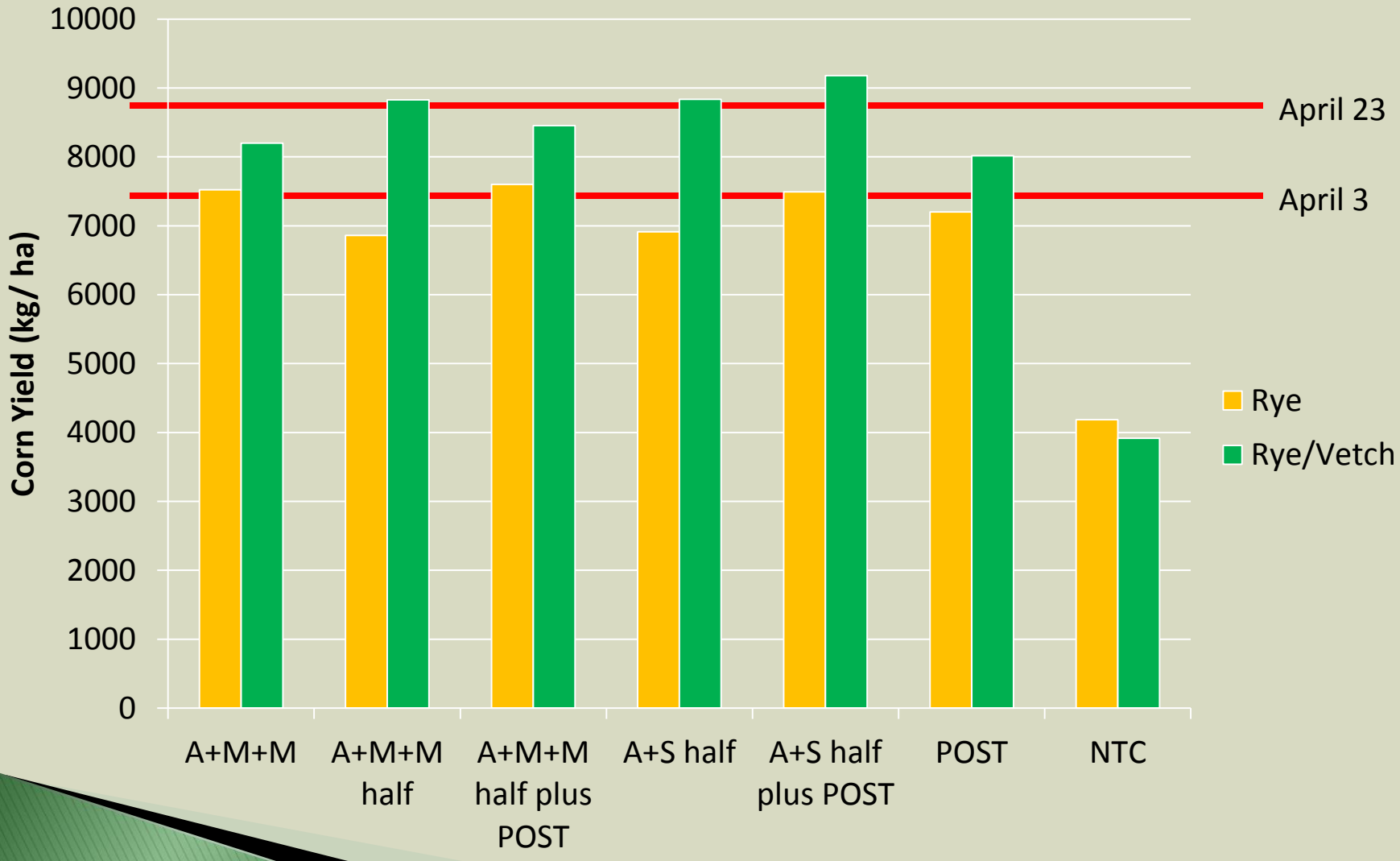
PRE Weed Control



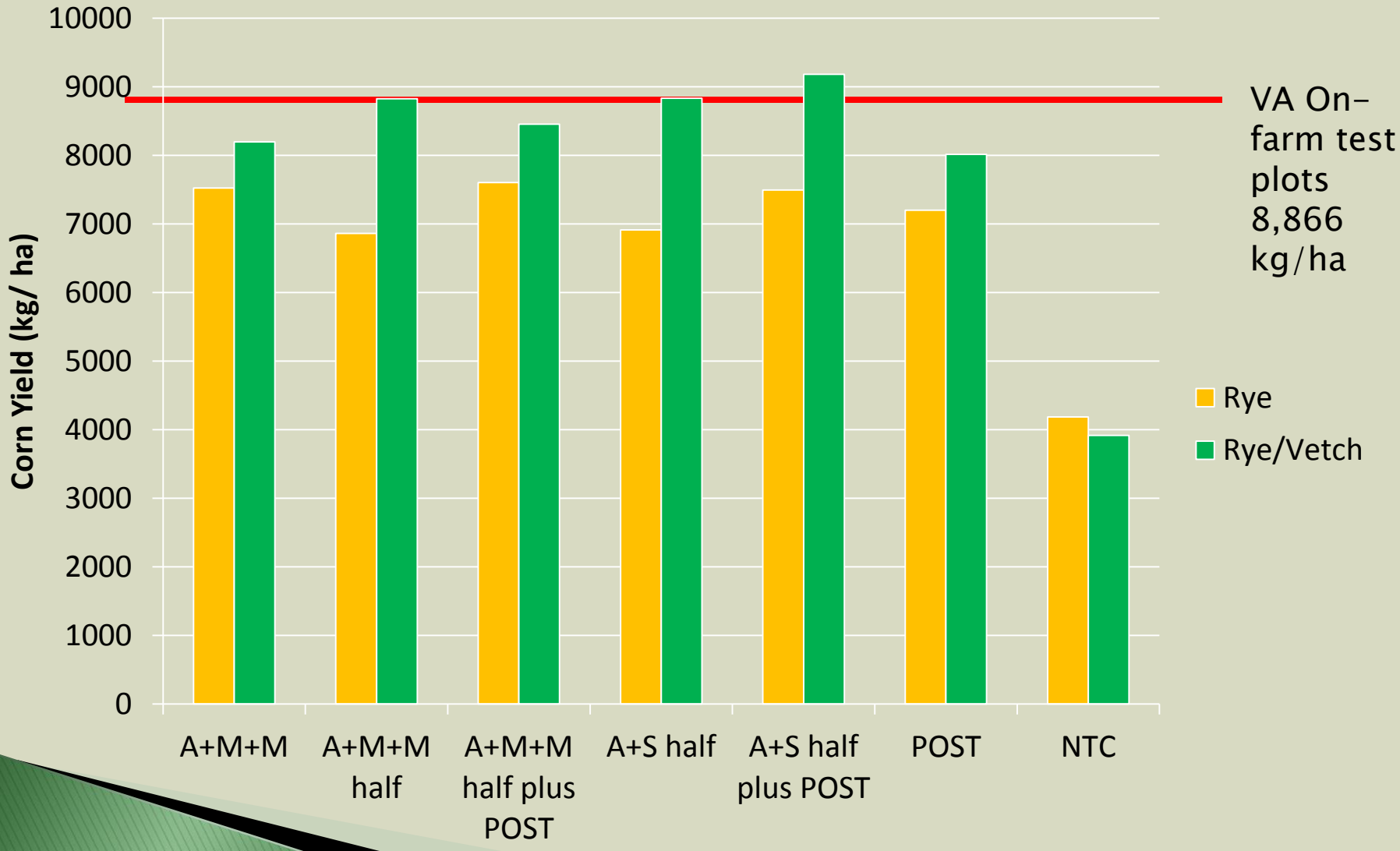
POST Weed Control



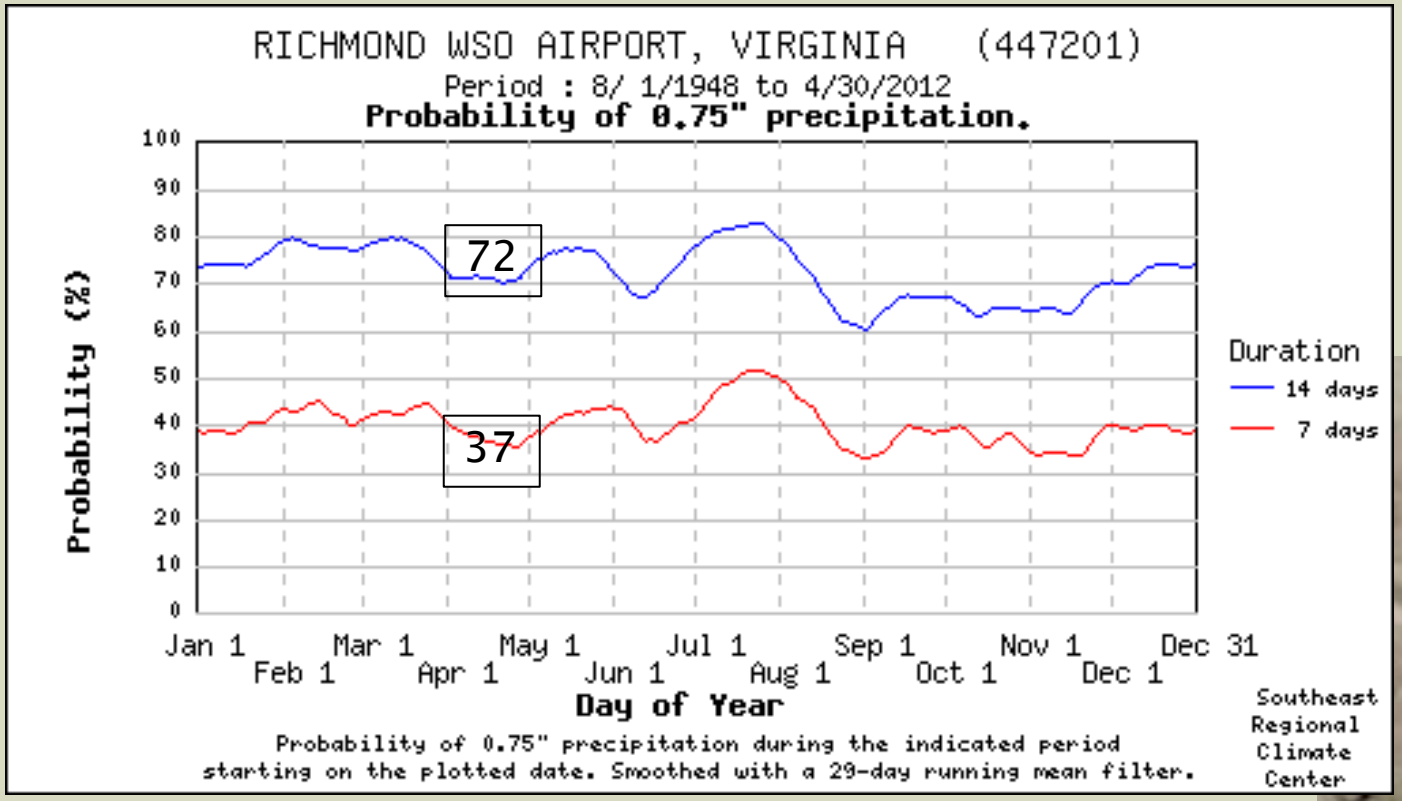
Corn Yield


10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Corn Yield (kg/ ha)
April 23
April 3
Rye
Rye/Vetch
A+M+M
A+M+M half
A+M+M half plus POST
A+S half
A+S half plus POST
POST
NTC

Corn Yield


10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Corn Yield (kg/ ha)
A+M+M
A+M+M half
A+M+M half plus POST
A+S half
A+S half plus POST
POST
NTC
VA On-farm test plots 8,866 kg/ha
Rye
Rye/Vetch

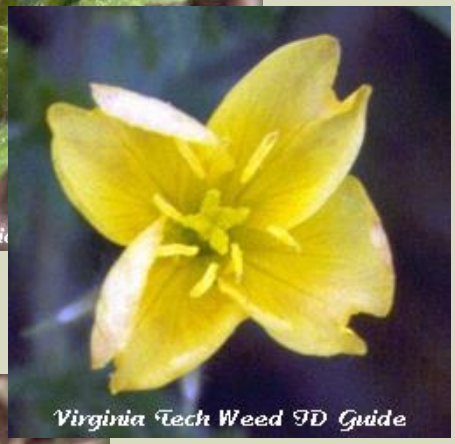
56 YEAR AVERAGE PROBABILITIES OF RAINFALL FOR HERBICIDE ACTIVATION WITHIN 7 OR 14 DAYS



COLD AND WET

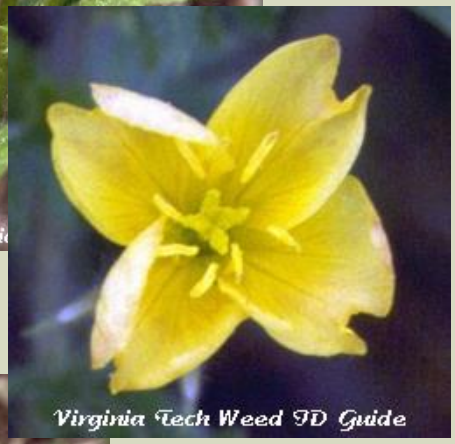
2014 PMG REVISIONS – SOYBEAN

- Added Authority Elite preemergence entry (sulfentrazone + metolachlor) for preplant incorporated or preemergence use.
- Added Zidua preemergence entry (pyroxysulfone) for residual control of annual grasses and some broadleaf weeds. Other pyroxysulfone herbicides include Fierce (with flumioxazin) and Anthem (with fluthiacet-methyl).



Resistant or Tolerant?


Virginia Tech Weed ID Gui


Virginia Tech Weed ID Guide


Virginia Tech Weed ID Guide


Virginia Tech Weed ID Guide


Virginia Tech Weed ID Guide

2,4-D !!

2014 – GLYPHOSATE – UNITED STATES

- Rigid ryegrass
- Horseweed spp.
- Italian ryegrass
- Hairy fleabane
- Common ragweed
- Giant ragweed
- Palmer amaranth
- Common waterhemp
- Spiny pigweed
- Johnsongrass
- Kochia
- Annual bluegrass
- Goosegrass

DON'T THROW THE BABY OUT WITH THE BATH WATER

Glyphosate and ALS-Resistant Palmer Amaranth: Tremendous Impact on Weed Control Programs

$6 vs $150

UNIVERSITY EXTESION: PALMER AMARANTH

- Invariably, researchers dealing with this weed agree that the use of residual herbicides is a critical component of control.
- While these residual herbicides will generally be applied at planting, several additional options exist for the inclusion of added residual herbicides with the postemergence herbicide application.
- Residual herbicide programs for the control of glyphosate-resistant Palmer amaranth will be based on herbicides families including ALS-inhibitors, dinitroanilines, chloroacetamides, and PPO-inhibitors.

Residual Characteristics of Herbicides used at Soybean Planting

	A. Assist	A. First	A. MTZ	Envive	Valor	V. XLT
Marestail		X		X	X	X
Evening Primrose				X	X	X
Morningglory spp.	X	X	X	X		X
Lambsquarters	X	X	X	X	X	X
Nightshade spp.	X	X	X	X	X	X
Pigweed spp.	X	X	X	X	X	X
Jimsonweed	X	X	X		X	X
Velvetleaf	X	X	X	X		X
Ragweed spp.		X				X

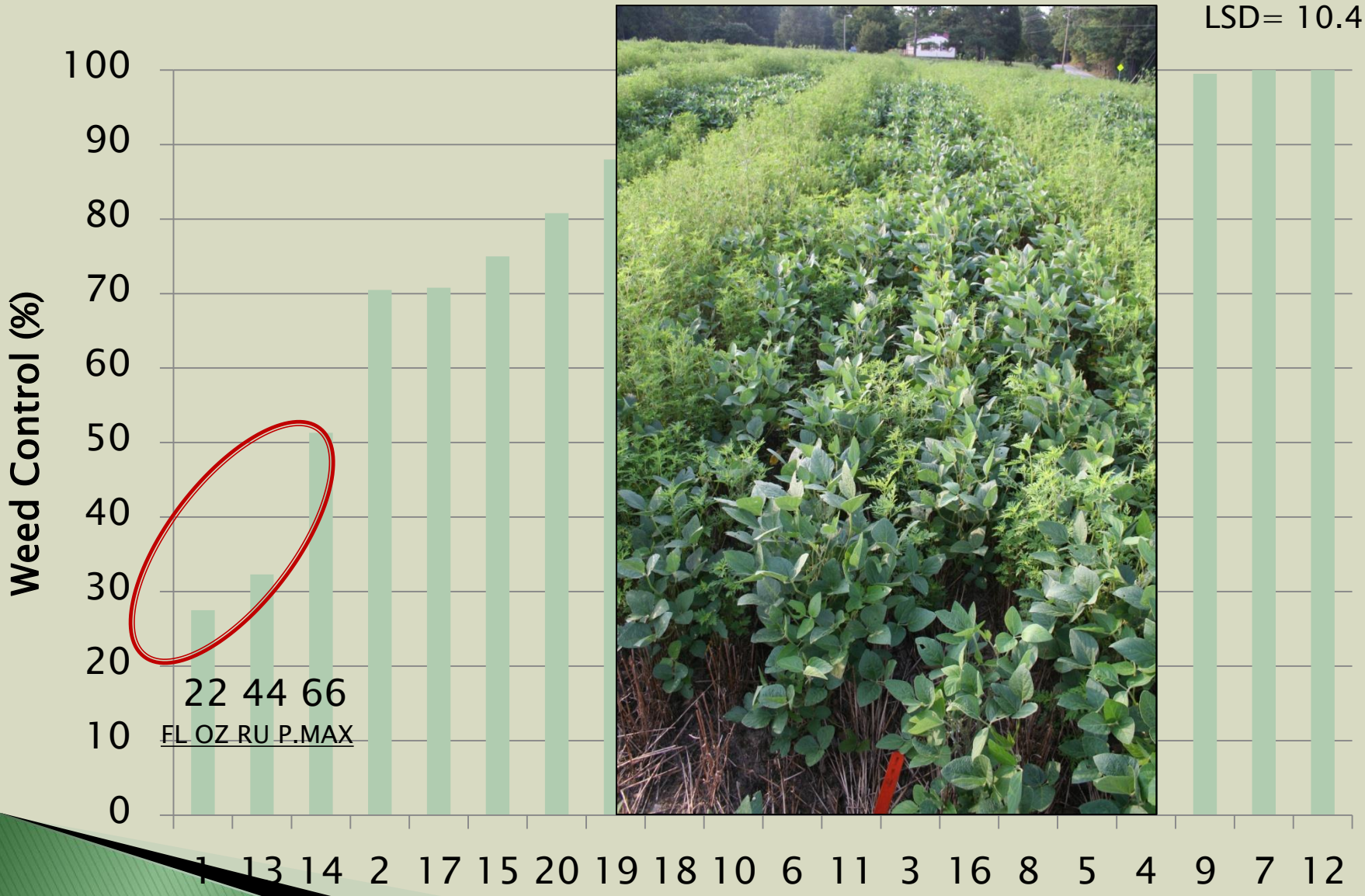
LIBERTY IN LIBERTY LINK SOYBEANS

ROUNDUP READY 2 XTEND™ SOYBEANS

Enlist™ Weed Control System

Glyphosate Resistant Common Ragweed Hanover County, Virginia – Confirmed in 2011

POST RAGWEED CONTROL



PRE
Authority XL
POST
Glyphosate + Flexstar

PRE
V-10233
POST
Glyphosate + Flexstar

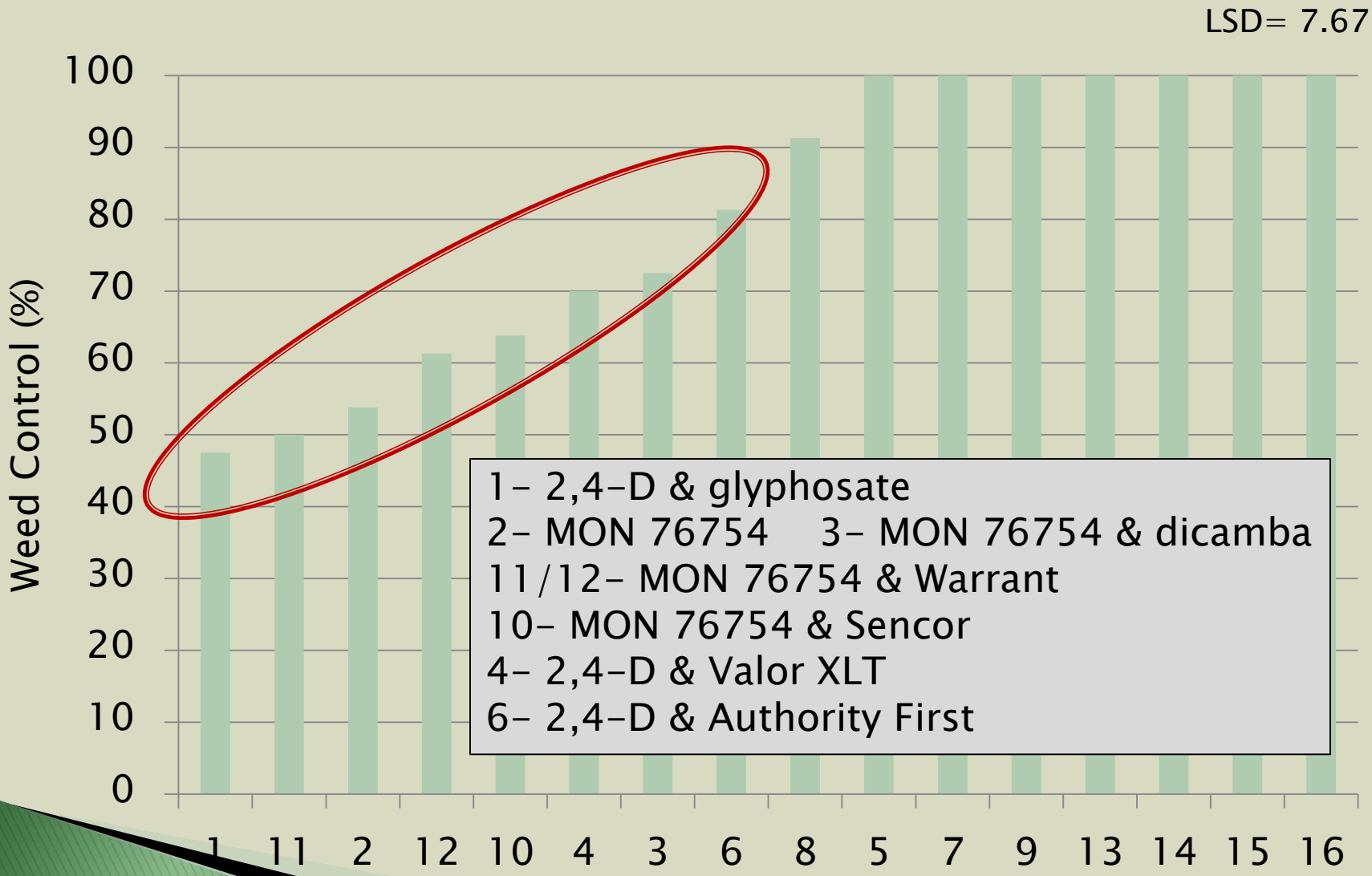
PRE
Valor XLT
POST
Glyphosate + Flexstar

Glyphosate-Resistant Common Ragweed Hanover County, Virginia – 2012 – DT Soybean

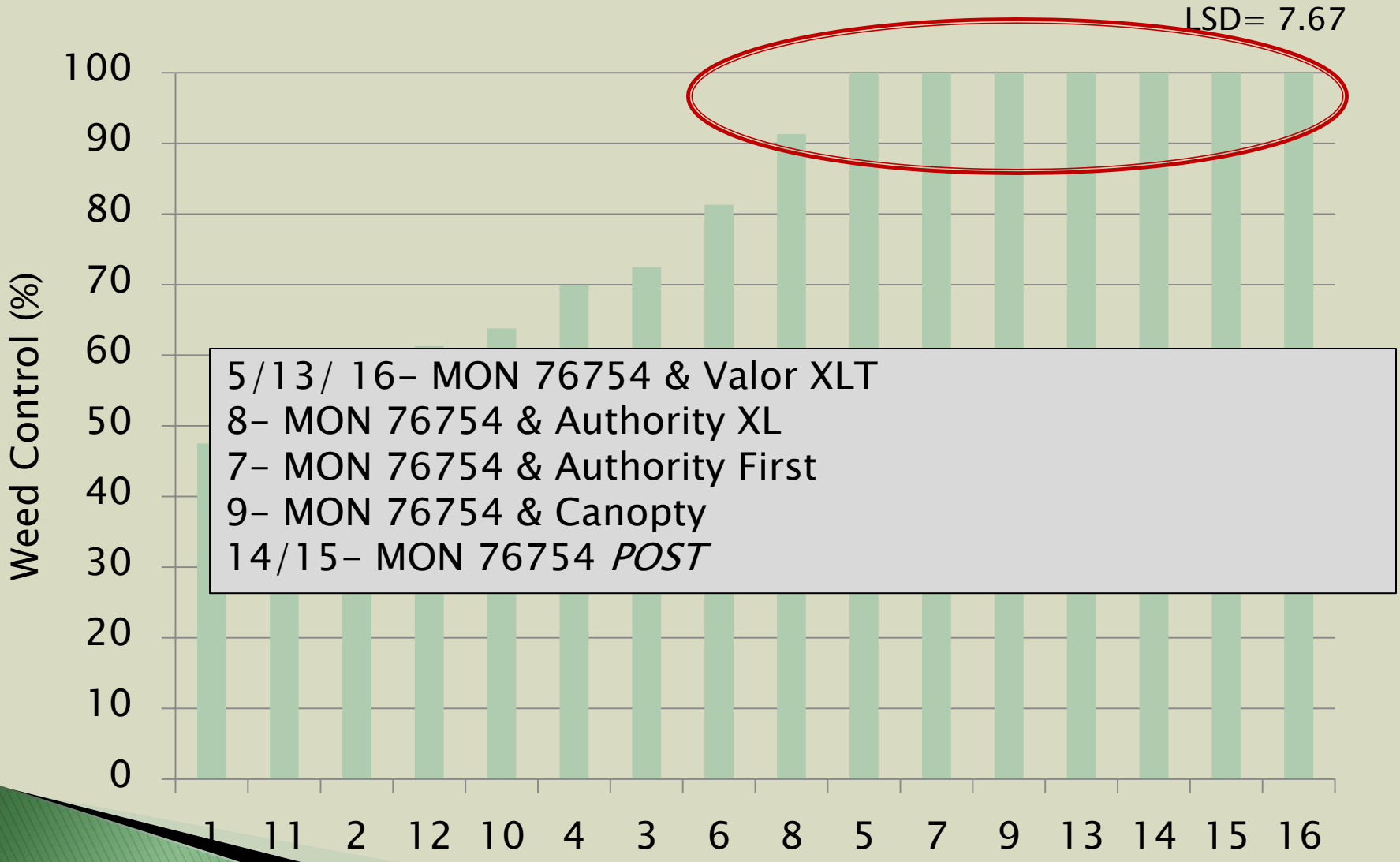
Not Treated

Due to dry soil conditions, most glyphosate-resistant ragweed germinated well after soybean planting, such that longer residual PRE herbicides, and POST herbicides, provided best levels of control. The following three slides show plots treated with glyphosate PRE and POST with additional herbicides as noted .

Trial 1 – Monsanto DT Treatments



Trial 1 – Monsanto DT Treatments



2,4-D PRE

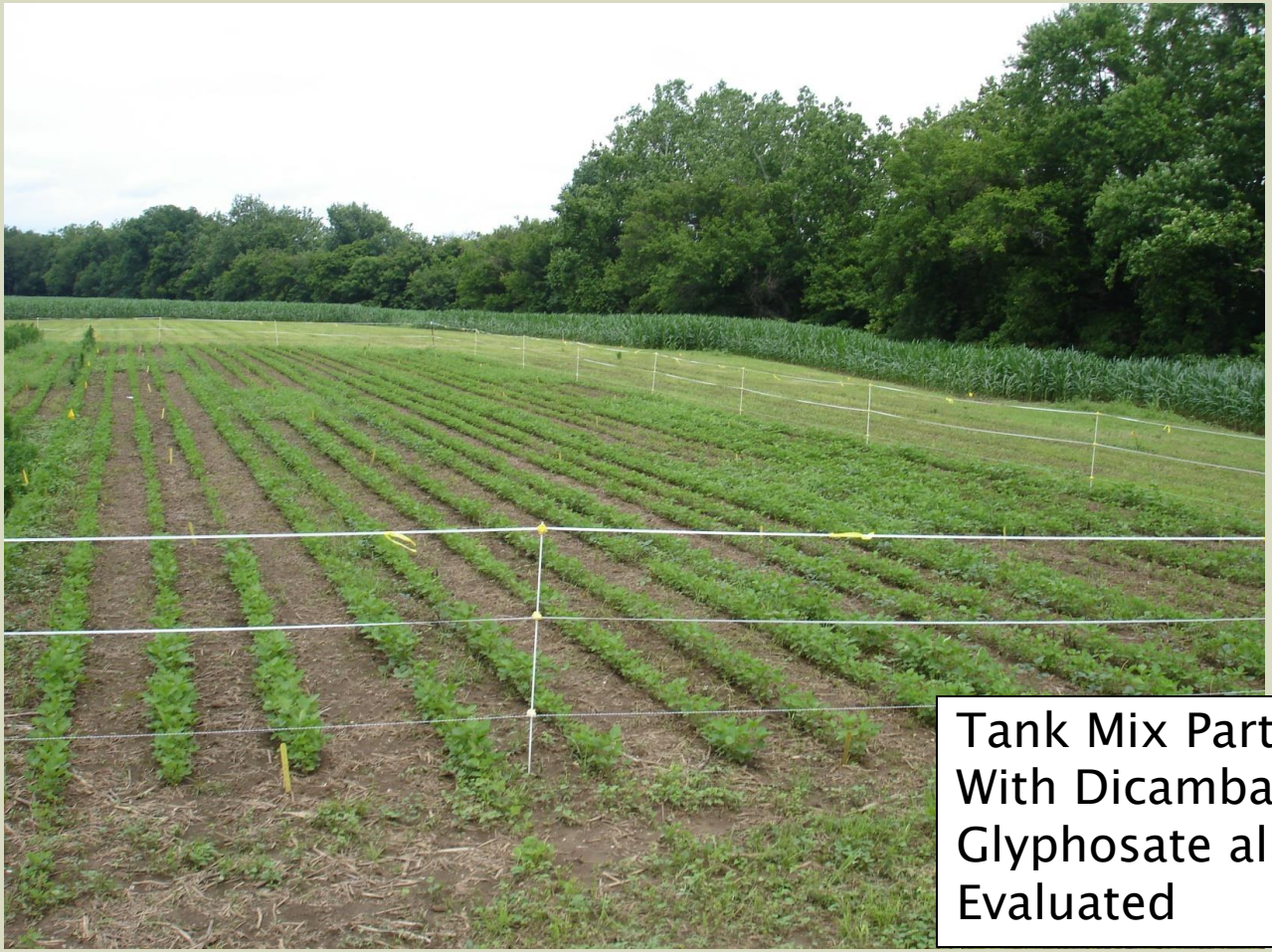
DICAMBA PRE

DICAMBA PRE
DICAMBA POST

2013 DICAMBA TOLERANT SOYBEANS VIRGINIA TECH – BLACKSBURG

Excellent Preemergence and Postemergence Herbicide Activity Observed

2013 DICAMBA TOLERANT SOYBEANS VIRGINIA TECH – BLACKSBURG



Tank Mix Partners With Dicamba and Glyphosate also Evaluated

2013 Pest Management Guide Resources

- Table 5.1: Guide to Prepackaged Mixes
- Table 5.2: Guide to Single Ingredient Herbicides
- Table 5.3: Important Herbicide Groups: Soybeans (Mode of Action – Resistance Management)
- Table 5.6: Selected Generic Alternative Herbicides
- Table 5.7: Crop Rotation Planting Restrictions

- Tables 5.39-44: Relative Effectiveness of Soybean Herbicides
- Table 5.45: Postemergence Broadleaf Herbicide Rate Chart

2014 PMG REVISIONS

SORGHUM

- Added Lumax EZ preemergence entry
- Added Lexar EZ preemergence entry

SMALL GRAINS

- Deleted Hoelon entries
- Changed PowerFlex entry to PowerFlex HL
- Added early preplant Valor entry (flumioxazin) for control of ALS-resistant common chickweed – now minimum of 7 days early preplant.

Weed Control in Small Grains: Grain and Forage Uses

Small Grain Herbicides: Mode of Action

HARMONY EXTRA SG
HARMONY SG
FINESSE
PEAK
OSPREY
POWERFLEX

ALS

BUCTRIL

PSI

AIM

PPO

2,4-D
BANVEL/CLARITY
STARANE ULTRA

Growth Regulators

PROWL H_2O

Seedling Growth

AXIAL XL

ACCase

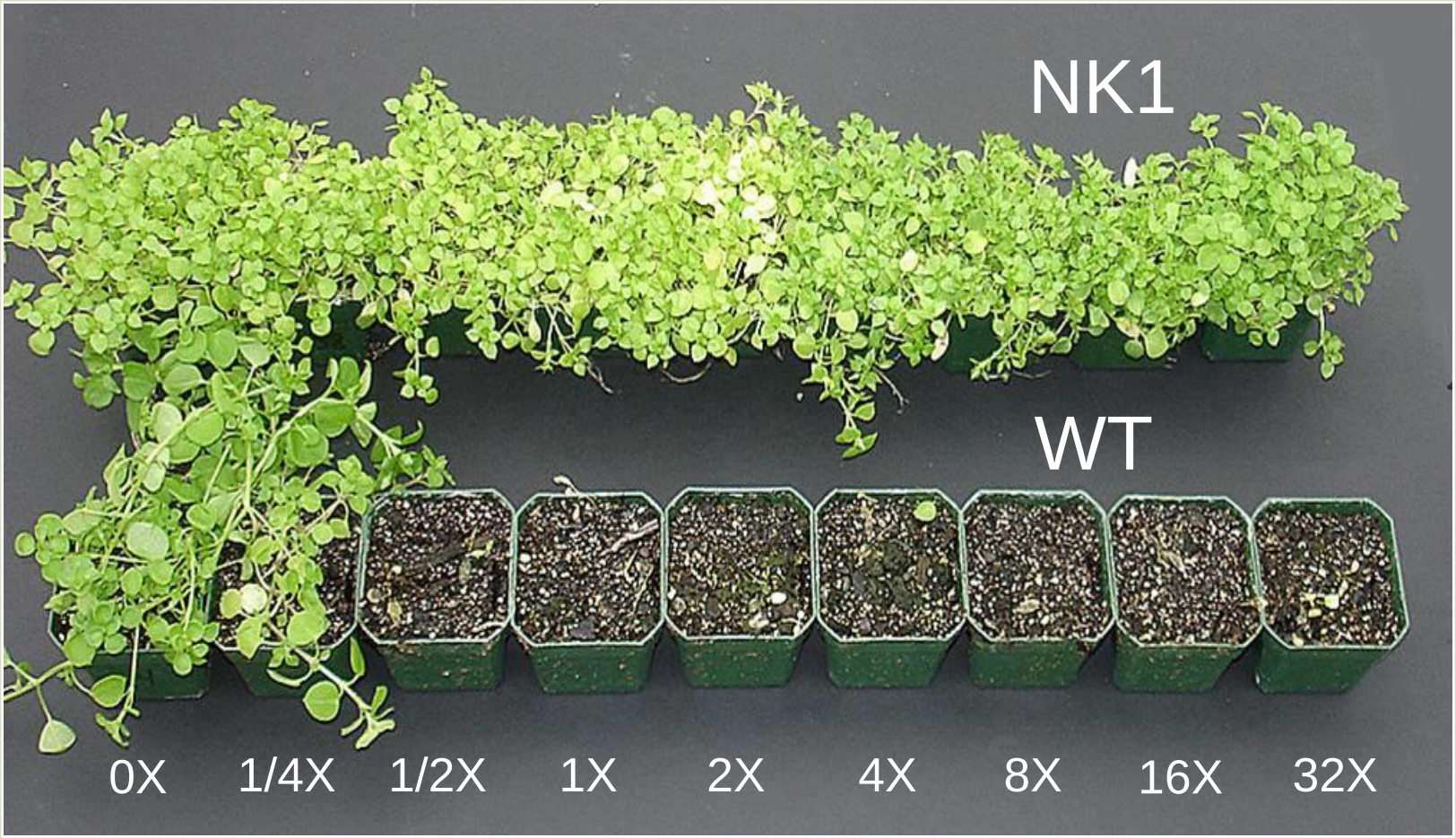
FINESSE GRASS AND BROADLEAF
AXIOM

Multiple

Characteristics of Herbicides for Control of Italian Ryegrass (LOLMU) in Virginia Small Grains

Trade Name	Labeled Crops	App. Timing	Nozzle Type	Apply in N	LOLMU Efficacy	Resist. Biotypes	Soybean PBI
AXIOM	W	DPRE	≥10 GPA	Y	G	N	0
AXIAL	W,B	POST	FF, 5-10 GPA	≤ 50% V/V	E	N?	4
FINESSE G + B	W	POST	FF ≥5 GPA	Y	E	N	nSTS-NS STS-6
OSPREY	W	POST	FF ≥10 GPA	N	E	N?	3
POWER-FLEX	W	POST	FJ ≥10 GPA	≤30 LB N/A	E	N	3

Effect of Thifensulfuron-methyl Application Rate on Common Chickweed Control – NK1 Source – 28 DAT



2012 ALS-RESISTANT CHICKWEED NEW KENT, VIRGINIA - FALL TREATMENTS

TREATMENT	RATE (OZ)	INJURY (%)	CHICKWEED (%)
HARMONY EXTRA	0.6	0	11 c
HARMONY EXTRA METRIBUZIN	0.6 2.0	0	97 a
HARMONY EXTRA METRIBUZIN	0.6 3.0	0	99 a
HARMONY EXTRA METRIBUZIN	0.6 4.0	0	100 a
HARMONY EXTRA STARANE	0.6 8.0	0	83 b
HARMONY EXTRA STARANE	0.6 10.7	0	90 ab
CONTROL	---	0	0 d

EFFECT OF FALL BURNDOWN PROGRAMS ON WEED CONTROL IN CEREAL COVER CROPS – 1 MAT MONTGOMERY COUNTY, VIRGINIA – 2012

	2,4-D	CLARITY	SHARPEN	2,4-D	CLARITY	SHARPEN
	COMMON CHICKWEED			PURPLE DEADNETTLE		
EXPRESS CLASSIC	63	79	79	61	56	71
CANOPY	84	75	84	68	53	78
HARMONY SG MATRIX (LR)	73	78	81	63	64	80
HARMONY SG MATRIX (HR)	70	70	82	56	61	76

VIRGINIA SPEEDWELL SPECIES

IVY LEAF

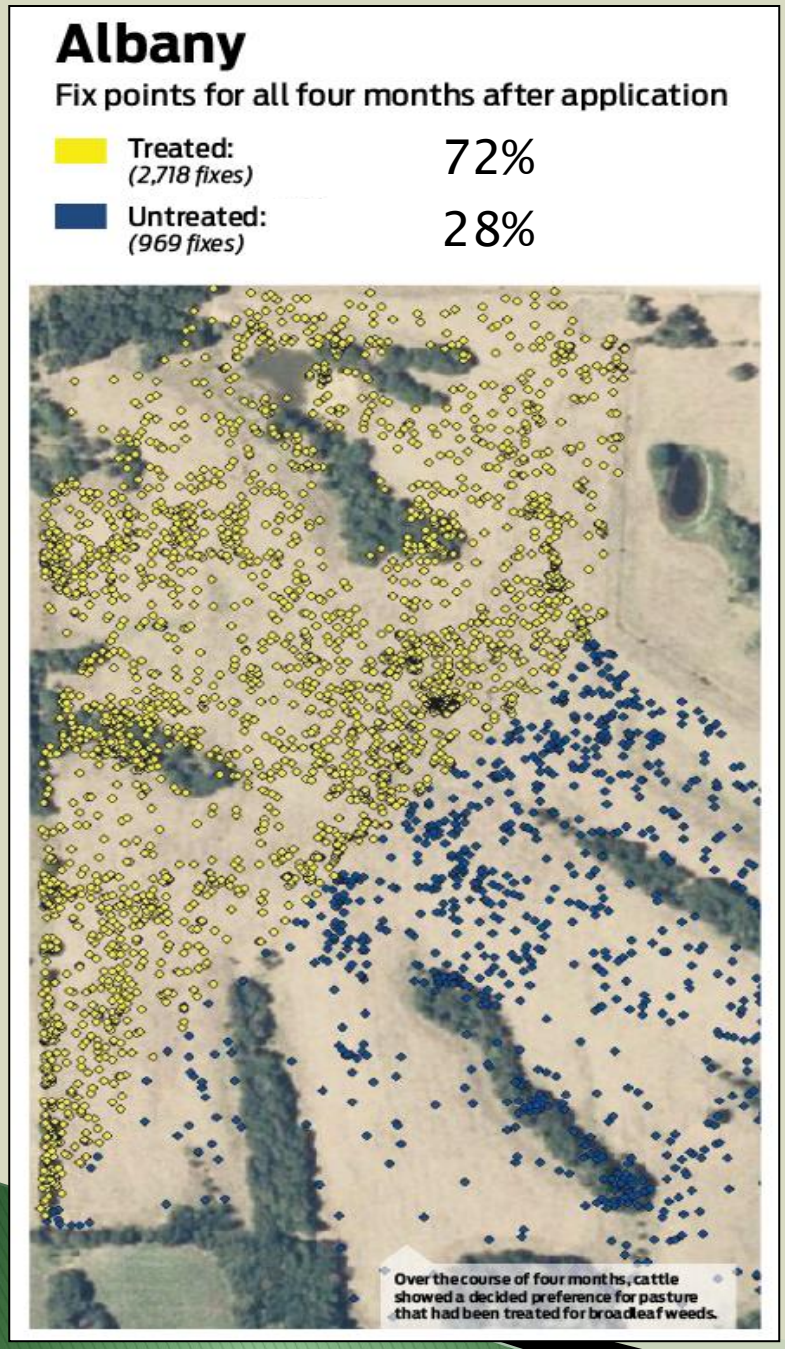
PERSIAN

EFFECT OF HERBICIDE COMBINATIONS WITH HARMONY EXTRA ON IVYLEAF SPEEDWELL CONTROL IN WHEAT 2 MAT – MONTGOMERY COUNTY, VIRGINIA 2011

HERBICIDE ADDED	SPEEDWELL	HERBICIDE ADDED	SPEEDWELL
NONE	35 d	AIM (LR)	77 ab
BANVEL (LR)	53 c	AIM (HR)	83 a
BANVEL (HR)	60 c	BUCTRIL (LR)	67 bc
SENCOR (LR)	68 bc	BUCTRIL (HR)	67 bc
SENCOR (HR)	83 a	OSPREY	87 a
POWERFLEX	63 bc	FINESSE	88 a
STARANE (LR)	58 c	CONTROL	0 e
STARANE (HR)	68 bc		

HARMONY EXTRA RATE = 0.75 OZ/ACRE

EFFECTS OF HERBICIDE TREATMENTS ON CATTLE GRAZING PREFERENCE
DR. KEVIN BRADLEY – UNIVERSITY OF MISSOURI –2009



EFFECT OF HERBICIDE TREATMENT ON CATTLE GRAZING PREFERENCE ALBANY, MISSOURI – 2009 DR. KEVIN BRADLEY

TIME	HERBICIDE TREATED	NOT TREATED
(MAT)	GRAZING TIME (%)	
0	53	47
1	51	49
2	76	24
3	84	16
4	77	23
TOTAL	72	28

"LET THE COWS VOTE"

ForeFront – Horsenettle Control and Forage Utilization

Effect of herbicide treatments on horsenettle control and forage composition and utilization – 7 WAT – Montgomery Co., Virginia

Treatment	Rate	Horsenettle Control (%)	Horsenettle Forage (%)	Fescue utilization
ForeFront	1.5 pt	80 b	0.6 c	70 a
ForeFront	2.0 pt	85 b	1.2 bc	78 a
ForeFront	2.5 pt	94 a	1.5 bc	80 a
2,4-D Ester	2.0 pt	24 d	9.2 ab	36 b
Cimarron	.30 oz	59 c	5.1 abc	45 b
Control	---	0 e	12.7 a	33 b

New Label Wording ForeFront, Milestone

- **Do not move hay made from grass treated with ForeFront HL off farm unless allowed by supplemental labeling.**

- Supplemental labeling allows hay transfer and sale with the provision that the buyer be fully informed in writing of legal uses of hay and of dangers to non-target plants associated with improper use.

- No supplemental label for VA or NC but supplemental label is in place for KY and TN.

Effect of DPX-MAT 28 Treatments on Rotational Legume Establishment – Initial Treatment: June 2009

Three months after treatment

Rate	Fall Seeding – September 2009 Stand (% of Control)			
	Alfalfa	B'foot Trefoil	Ladino Clover	Red Clover
0.5 oz	73 B	75 B	72 B	80 B
1.0 oz	45 C	53 C	45 C	50 C
2.0 oz	20 D	33 CD	21 D	29 D
4.0 oz	5 D	18 D	11 D	6 E
Control	100 A	100 A	100 A	100 A

Effect of DPX-MAT 28 Treatments on Rotational Legume Establishment – Initial Treatment: June 2009

Ten months after treatment

Rate	Spring Seeding – April 2010 Stand (% of Control)			
	Alfalfa	B'foot Trefoil	Ladino Clover	Red Clover
0.5 oz	100 A	100 A	100 A	100 A
1.0 oz	95 A	95 A	69 B	65 B
2.0 oz	90 A	94 A	38 C	20 C
4.0 oz	53 B	65 B	8 D	8 C
Control	100 A	100 A	100 A	100 A

HORSENETTLE CONTROL

TREATMENT	HORSENETTLE CONTROL 30 DAT	HORSENETTLE CONTROL 60 DAT	HORSENETTLE CONTROL 90 DAT
DPX-MAT28 2,4-D (LR)	98	100	100
DPX-MAT28 2,4-D (HR)	99	100	100
DPX-RDQ98 (LR)	73	89	100
DPX-RDQ98 (HR)	100	100	100
FOREFRONT	98	100	100
LSD (0.05)	5	4	--

BULL THISTLE CONTROL – LATE SPRING

TREATMENT	BULL THISTLE CONTROL 30 DAT	BULL THISTLE CONTROL 60 DAT	BULL THISTLE CONTROL 90 DAT
DPX-MAT28 2,4-D (LR)	100	100	100
DPX-MAT28 2,4-D (HR)	100	100	100
DPX-RDQ98 (LR)	100	100	100
DPX-RDQ98 (HR)	100	100	100
FOREFRONT	100	100	100
CONTROL	0	0	0

IN ADDITIONAL TRIALS, TREATMENTS OF MAT-28 PLUS METSULFURON, CHLORSULFURON, TRICLOPYR, OR 2,4-D AFFORDED COMPLETE CONTROL OF ROSETTE STAGE BULL THISTLE.

TALL IRONWEED CONTROL

TREATMENT	TALL IRONWEED CONTROL 30 DAT	TALL IRONWEED CONTROL 60 DAT	TALL IRONWEED CONTROL 90 DAT
DPX-MAT28 2,4-D (LR)	88	98	100
DPX-MAT28 2,4-D (HR)	98	100	100
DPX-RDQ98 (LR)	85	99	100
DPX-RDQ98 (HR)	93	100	100
FOREFRONT	98	100	100
LSD (0.05)	8	4	--

GOLDENROD CONTROL

TREATMENT	GOLDENROD CONTROL 30 DAT	GOLDENROD CONTROL 60 DAT	GOLDENROD CONTROL 90 DAT
DPX-MAT28 2,4-D (LR)	44	60	66
DPX-MAT28 2,4-D (HR)	50	85	84
DPX-RDQ98 (LR)	47	89	91
DPX-RDQ98 (HR)	58	93	96
FOREFRONT	55	83	80
LSD (0.05)	7	6	8

COMMON RAGWEED AND MARESTAIL CONTROL AMINOCYCLOPYRACHLOR PRODUCT BLENDS – 2013

COMMON RAGWEED CONTROL AMINOCYCLOPYRACHLOR PRODUCT BLENDS – 2013

DPX-MAT28
1.0 OAA

COMMON RAGWEED
76% 14 DAT

MARESTAIL
73% 14 DAT

COMMON RAGWEED CONTROL AMINOCYCLOPYRACHLOR PRODUCT BLENDS – 2013

DPX-MAT28 2.44 OAA +
DPX-L5300 0.31 OAA

COMMON RAGWEED
90% 14 DAT

MARESTAIL
88% 14 DAT

2013 MAT28 LARGE PLOT TRIALS


SURRY COUNTY, NC
CONTROL
HORSENETTLE, BROADLEAF DOCK, MARESTAIL,
VIRGINIA PEPPERWEED, COMMON RAGWEED, SPINY PIGWEED


DPX-MAT28
1.0 OAA
2,4-D AMINE
7.6 OAA

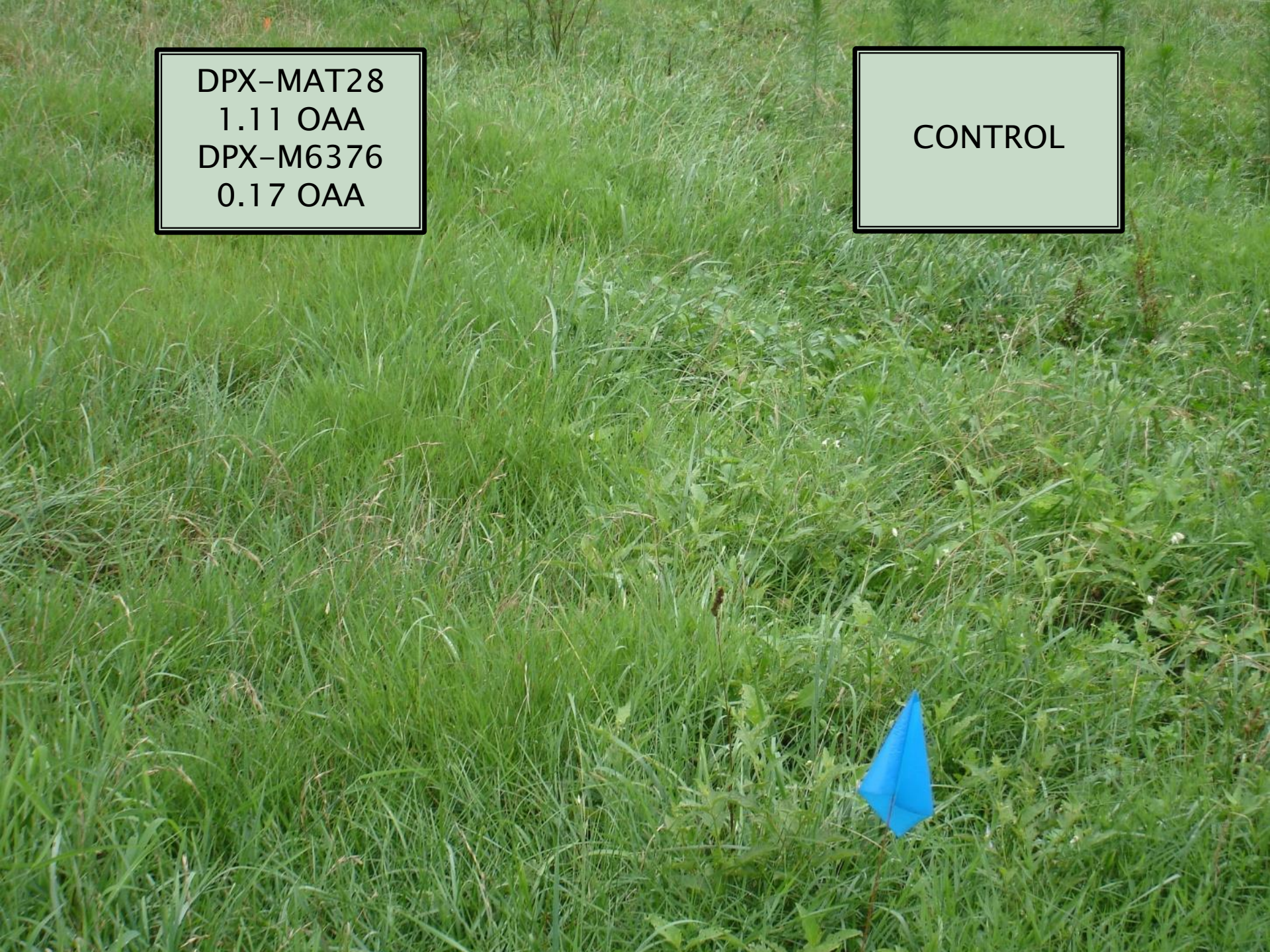

DPX-MAT28
2.00 OAA
2,4-D AMINE
15.2 OAA


DPX-MAT28
1.78 OAA
DPX-T6376
0.27 OAA

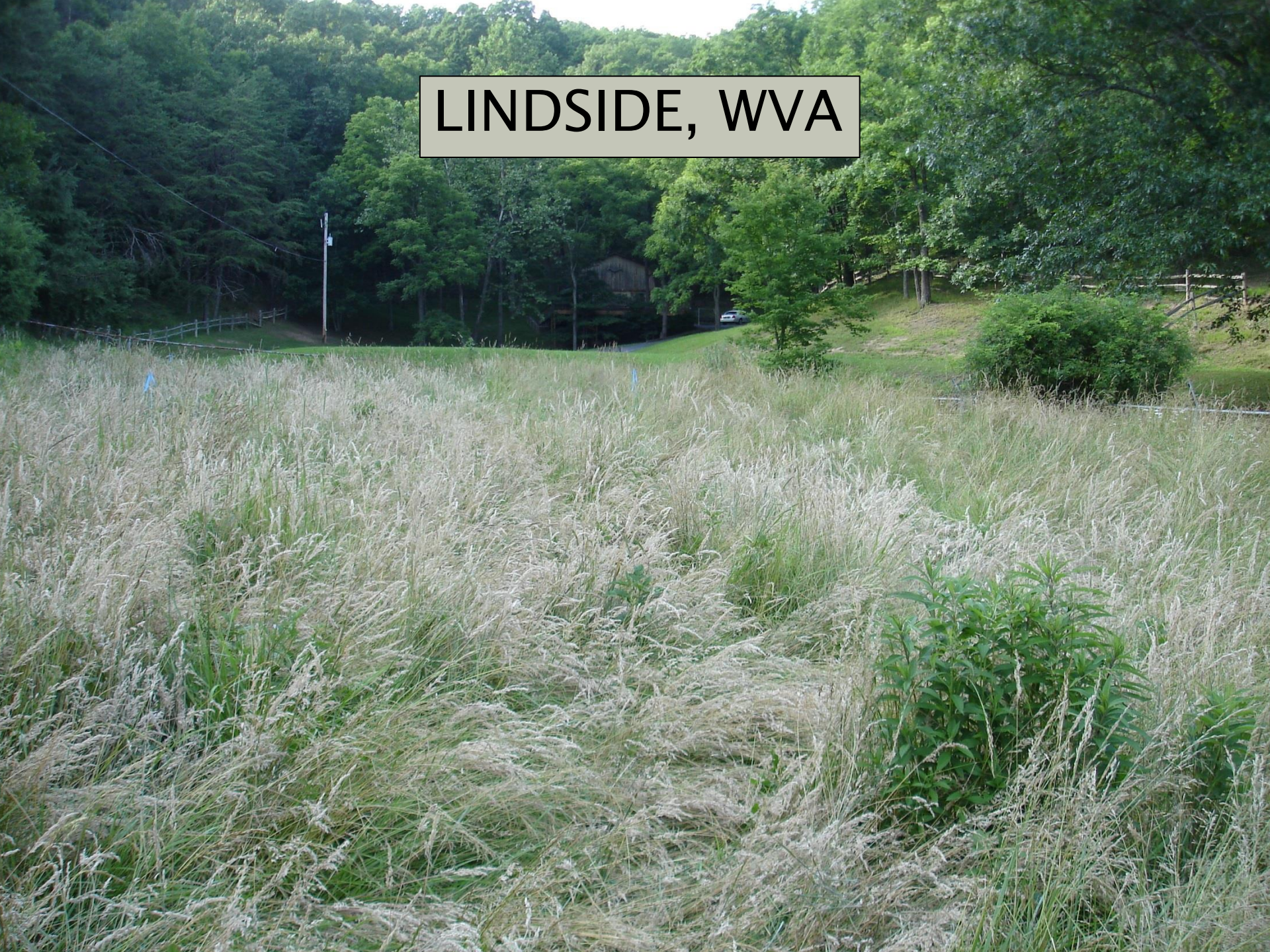

DPX-MAT28
1.11 OAA
DPX-M6376
0.17 OAA


FOREFRONT
2.0 PT/A


CONTROL


DPX-MAT28
1.11 OAA
DPX-M6376
0.17 OAA
CONTROL


AMELIA, VA


LINDSIDE, WVA


LINDSIDE WVA


CULPEPPER, VA

JOHNSONGRASS CONTROL IN HAYFIELDS

QUESTIONS??