

MAKING THE BEST DECISIONS IN YOUR FORAGE INVESTMENT

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> Consider These in Your Forage Investment

Alfalfa Genetics

1

Quality Traits

2

Disease Tolerance

3

Coated Seed

4

Forage Sorghum, Sorghum x Sudan rotations

5

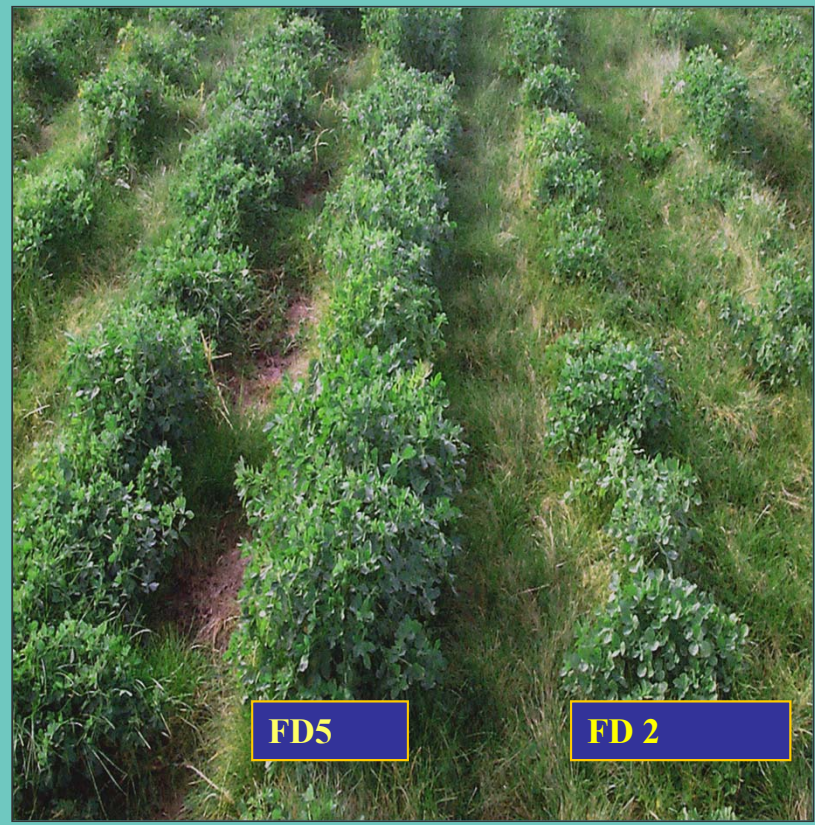
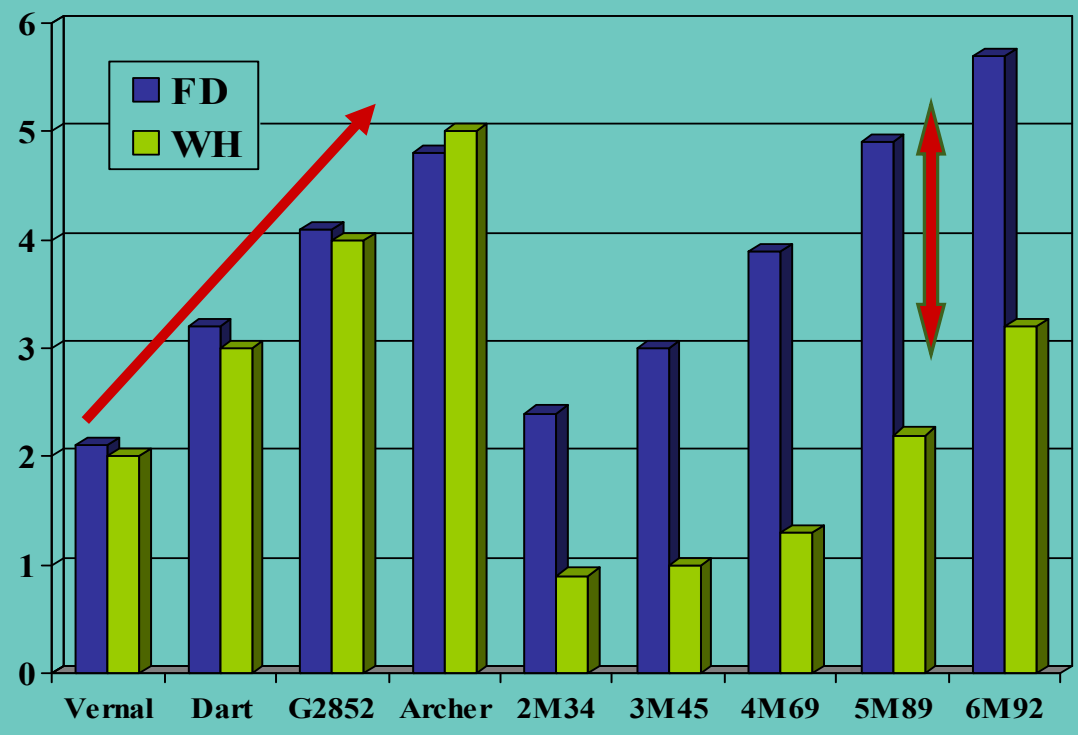


Alfalfa Genetics

- Fall Dormancy/
Winterhardiness
- Quality Potential
- Yield Potential
- Insect/Disease Resistance

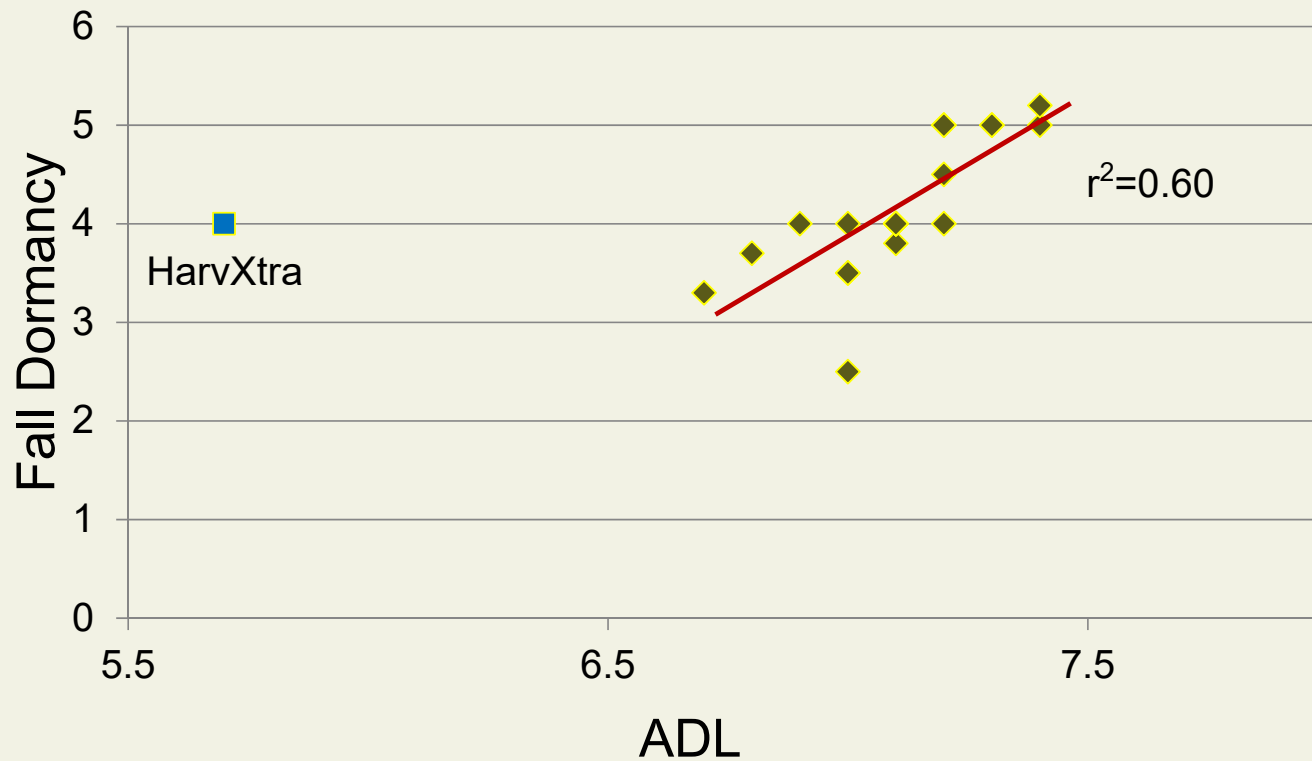


Fall Dormancy and Winterhardiness



2014 FD/ADL

(mean of four cuts in 2013 WS Demo)



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Alfalfa Trait Selection

HARVXTRA® ALFALFA

- Reduction in lignin for significant improvement in digestibility
- Harvest flexibility; higher quality or delay harvest for higher yield
- Stacked with Roundup Ready® Trait

ROUNDUP READY® ALFALFA

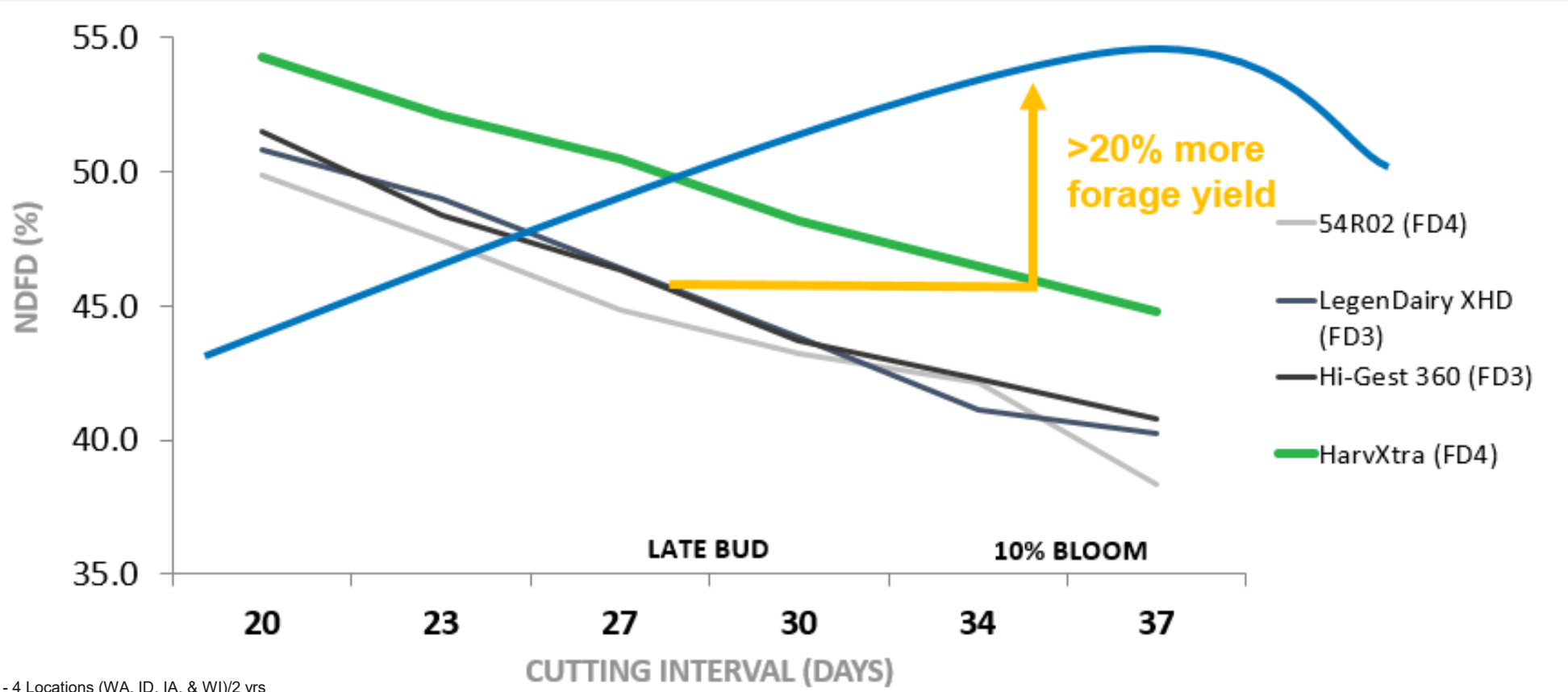
- Application flexibility for greater weed control options
- Early weed control delivers a higher percentage of pure alfalfa for higher-quality feed

CONVENTIONAL ALFALFA

- Developed through conventional breeding, not GE
- Excellent genetics for high yield and improvement in forage quality
- High resistance to several key insects and diseases
- OMRI Listed® Apex™ Green coated seed option for organic hay production



Delay Harvest for Increased Yield Potential Without Sacrificing Quality



NDFD - 4 Locations (WA, ID, IA, & WI)/2 yrs

CROPLAN® + HARVXTRA®: YOUR FARM. YOUR GOALS.



Forage Quality

OR

Increased Yield

'Normal' harvest interval

Lignin reduction provides
higher forage quality

Contains an avg. of 17%
higher NDFD

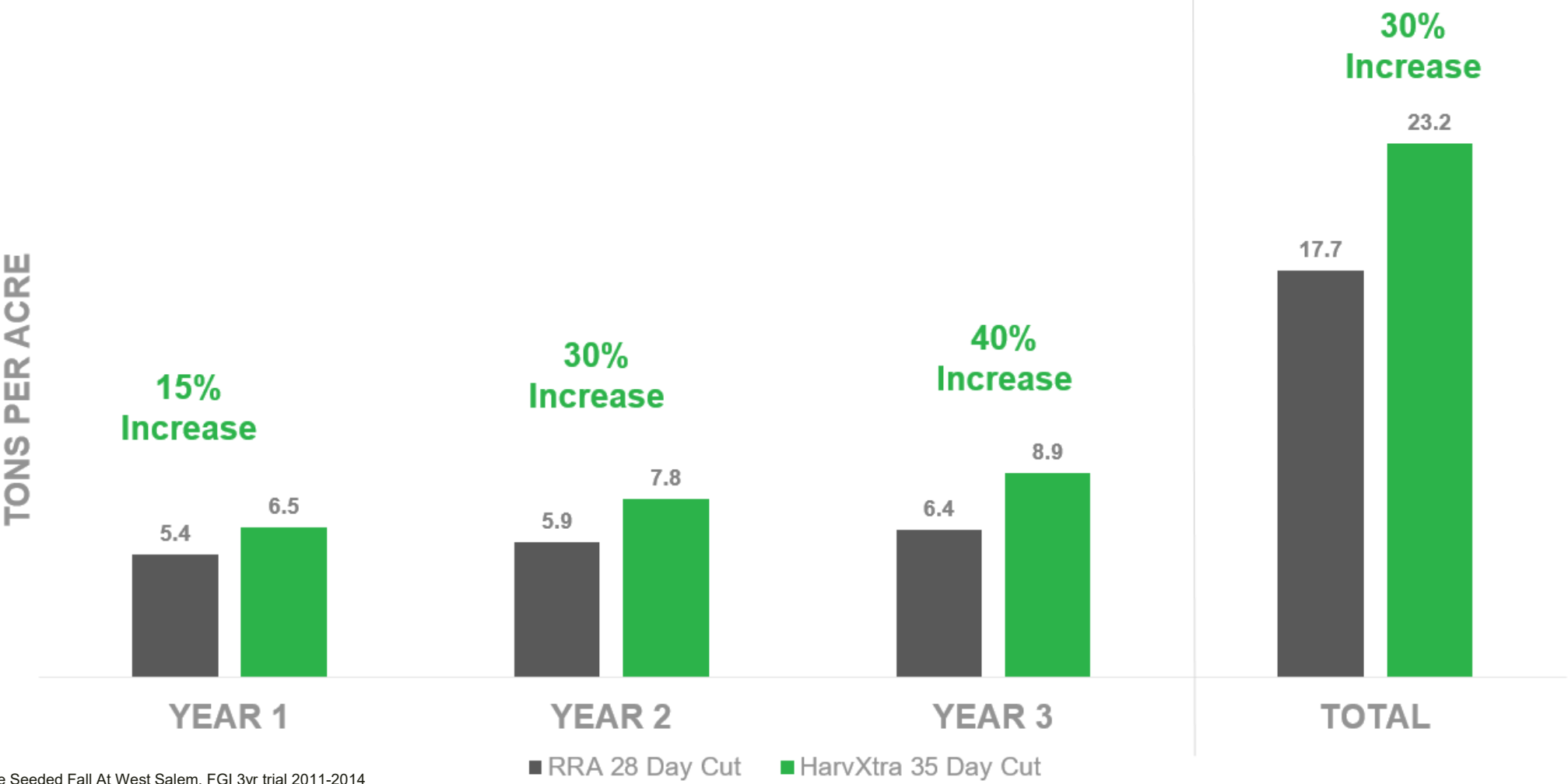
Delay harvest ~35d interval

Improved plant health &
stand persistence

Avg. 30% yield increase
over life of stand

Similar forage quality as
conventional alfalfa

Delay Harvest For Higher Yield Potential



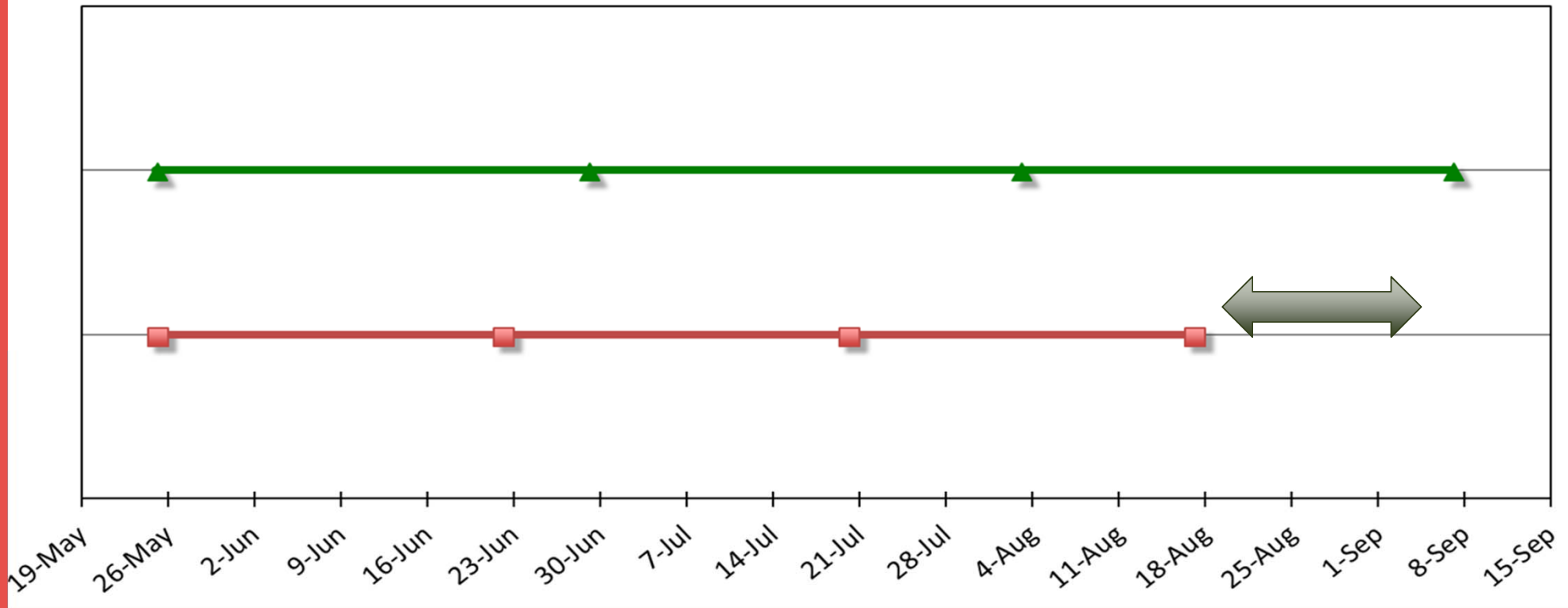
Source Seeded Fall At West Salem, FGI 3yr trial 2011-2014



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Alfalfa Harvest Schedules

■ 28 days ▲ 35 days



HarvXtra[®] Alfalfa Technology Harvest Management Trial

Faster Regrowth, Better Stand Persistence!



38-d

33-d

28-d

2017 Fall Seeded Cutting Management Trial, FGI Research Facility in West Salem, WI
28-d and 38-d trials cut on 8/16/18

Yield advantages with HarvXtra[®] alfalfa technology

Cutting management opportunities – 28 day vs 38 day schedule regrowth



28 day cutting schedule, cut 4



38 day cutting schedule, cut 3

2017 Fall Seeded Cutting Management Trial, FGI Research Facility in West Salem, WI
Both trials cut on 8/16/18

Cutting management changes will “weed-out” the competition

28 day cutting
schedule, cut 4



FGI Research Facility, West
Salem, WI
2017 Fall Seeded Cutting
Management Trial
Cut on 8/16/18

Value Upgrade

HarvXtra[®] Alfalfa Technology with Roundup Ready[®] Trait

From Roundup Ready[®] Alfalfa Technology alone

- Costs \$4/acre per cutting (assuming 4 cuts/4 years)

OR

- HVX tech fee per ton/ 75 ton (yield potential per bag) = \$2/ton

From Conventional Alfalfa

- Costs \$7/acre per cutting (assuming 4 cuts/4 years)

OR

- HVXRR tech fee per ton/ 75 ton (yield potential per bag) = \$4/ton

Disease Tolerance

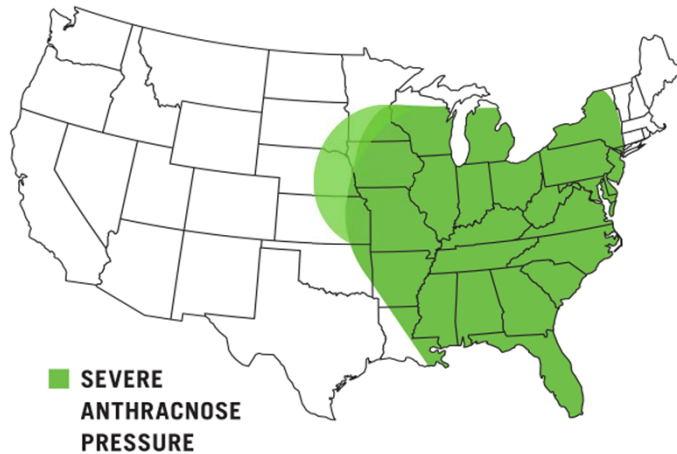
- New races of diseases affecting alfalfa are becoming more prevalent
- Can cause significant loss
 - Poor stand production = yield loss
 - Leaf loss = quality + yield loss
 - Stem and crown damage = yield loss
 - Plant death = yield loss
- Breeding efforts to include 'built-in' resistance



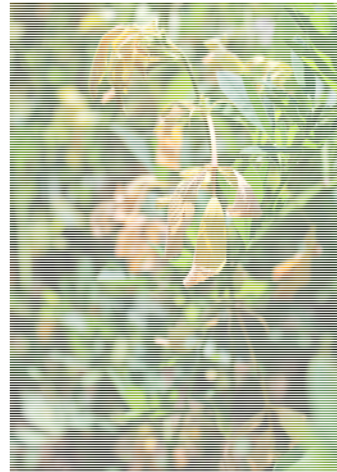
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Anthracnose



HVX MegaTron
or
Rebound AA
HR to Multi-Race
Anthracnose



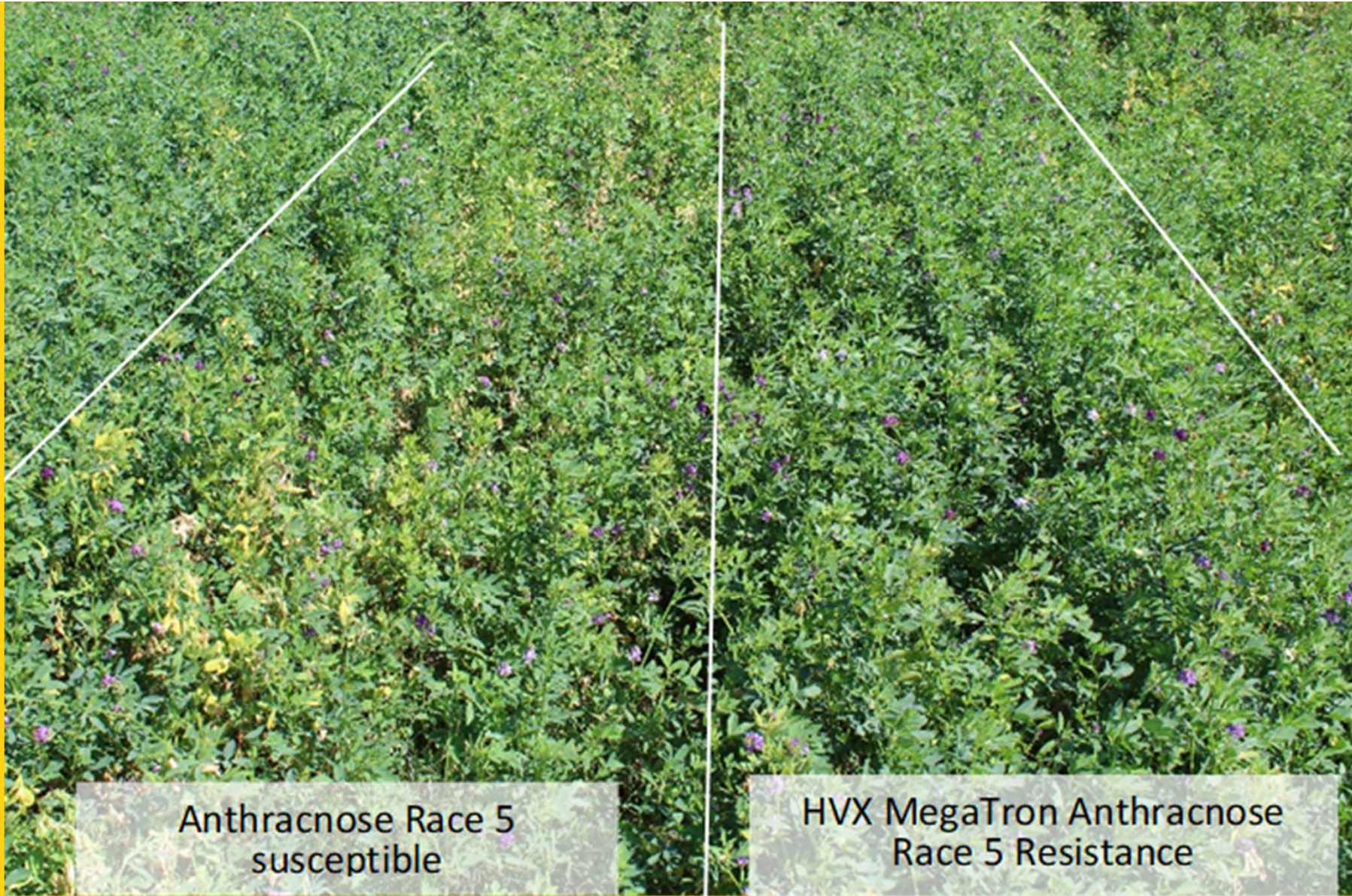
Multi-Race 1-4, NEW 5

Multiple races in late
season

Occurs under moist
conditions

Diamond shaped lesions
and shepherd's hook

Significant yield loss or
plant death



Anthracnose Race 5
susceptible

HVX MegaTron Anthracnose
Race 5 Resistance

Aphanomyces

Race 1, 2/3

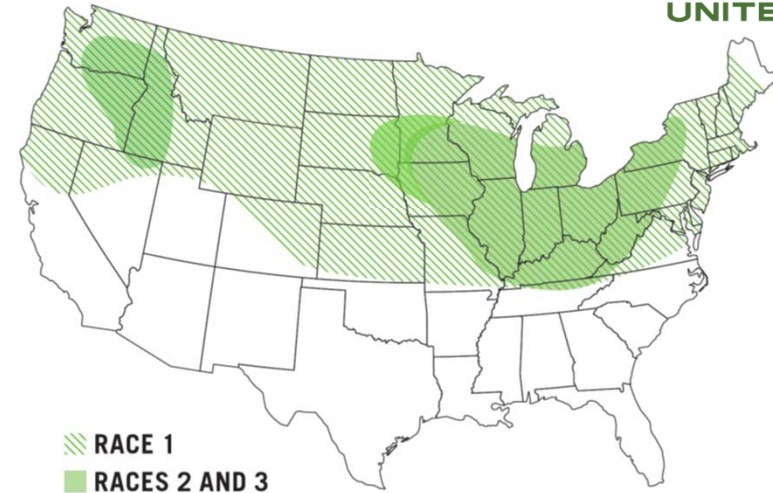
Found in Poorly
Drained Soils

Gray, water-soaked
roots

yellowed cotyledons

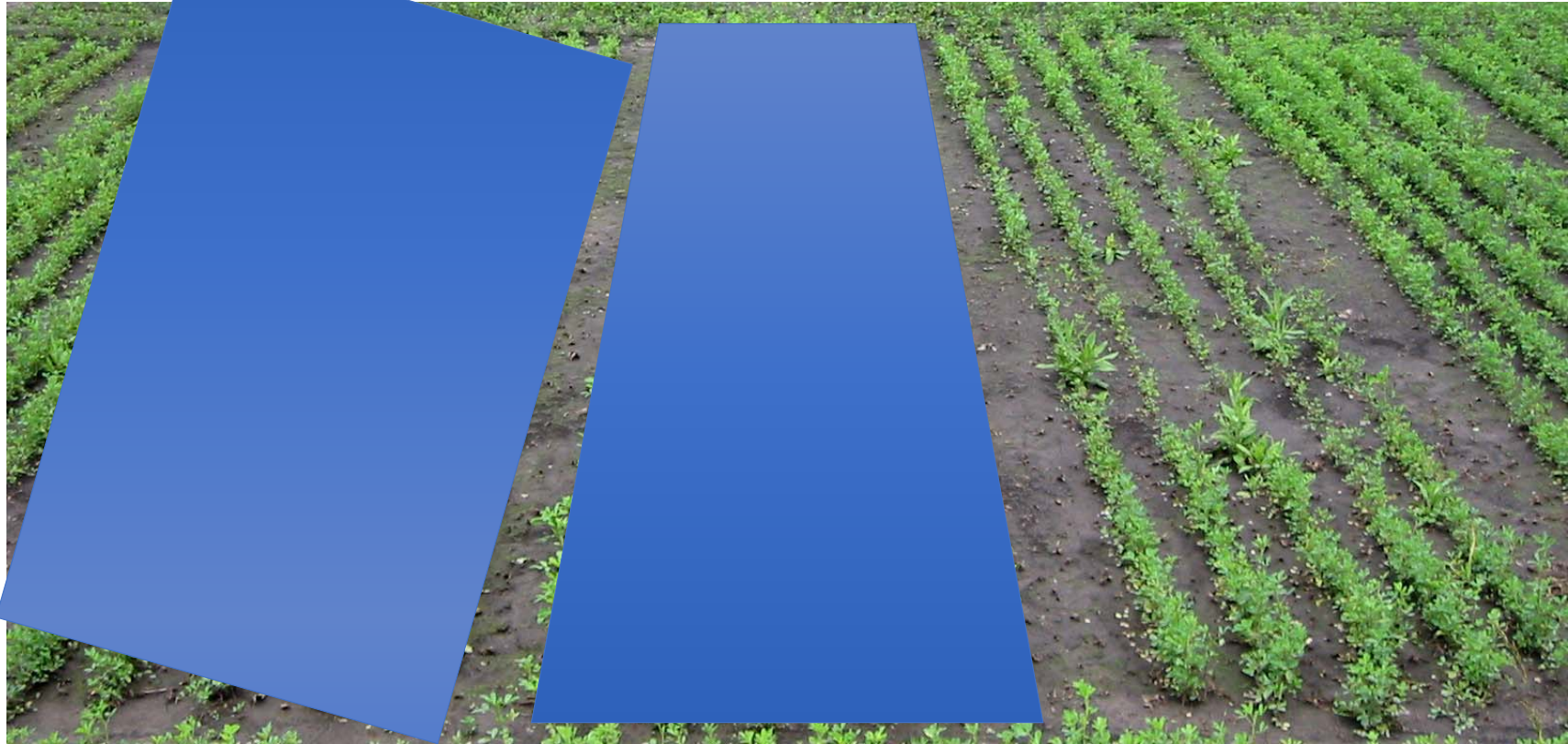
stunted growth/
reduced yield

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**HVX MegaTron,
RR AphaTron 2XT,
Rebound AA**
HR to Multi-Race
Aphanomyces

Heavily tested, new release varieties with high resistance to all races and complexes of **Aphanomyces**



54QR02
HR Aph R 1

HVX HarvaTron
HR Aph R 1, 2

HVX MegaTron
HR Aph R 1, 2/3



Seeded Spring 2017

This is Your Alfalfa



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This is Your Alfalfa with Multi-Race Aphanomyces



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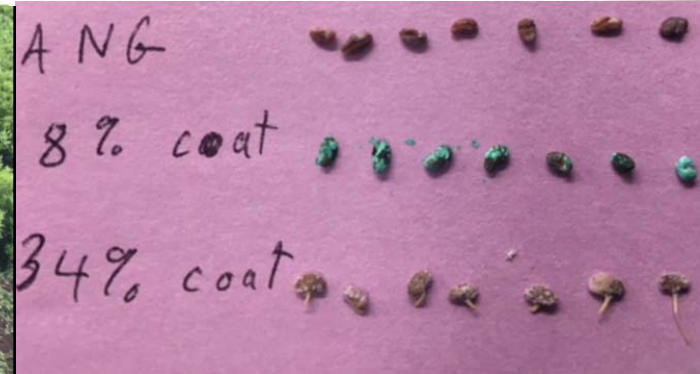
**CROPLAN® HVX MegaTron with
HR to Multi-Race Aphanomyces**

**Competitor Variety without HR
to Multi-Race Aphanomyces**



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Are There Benefits of Coated Seed?



What do detractors say about coated seed?

- Why do I call them “detractors?”
 - What is most important

Detracting statements:

- Less seed in the bag
- You're paying too much for the seed
- You're buying “filler”
- Increase seeding rate

The coated seed advocate rebuttal

1. Less seed is misleading
 - Suggests not as good of a stand
2. Don't change the seeding rate
3. Better imbibition/germination
4. Higher seed treatment rate
5. Better vigor under disease pressure
6. Coating facilitates/enhances the addition of products

Is there science behind this, or is it fluff?

1) Less seed in the bag – WHAT?

- There is less seed in the bag – you got me
- What seeding rate do you use or recommend?
 - How many above 15lbs. – 20lbs?
- How many seedlings do you need?
- DO THE MATH
 - 200,000 seeds/lb.
 - 15lb./acre seeding rate
 - 35% coating >> $200000 \times 15 \times .65 \div 43560 = 44.8$
 - 45 seeds/ft² dropped
 - More than 2x needed

2) Don't change the seeding rate

- Detractors say to plant on PLS basis
 - What is PLS?
- Coating changes PLS concept
- Experience?
- Keep the seeding rate the same
- Is this real? Is there data behind it?

2018 Purdue University study

Alfalfa and Red Clover Stand Establishment

Forage Management Day at Feldun-Purdue Agricultural Center

August 9, 2018

- Seeding Date: May 2, 2018
- Varieties: Magnum 7 for alfalfa and Durango for red clover
 - Uncoated alfalfa seed
 - Coated alfalfa seed
 - 2/3 rate uncoated
 - 2/3 rate coated
- 4 reps with plots 2.5 by 20 feet
- Counted on June 29, 2018

2018 Purdue University Study

	lbs. bulk seeded/A	lbs. PLS per acre	PLS/ft ²	Stand counts (plants/ft ²)	Seedling success
Uncoated seed	21.8	16.3	78	30	38.5%
coated seed	21.8	11.8	56	35 (29.5)*	52.7%
2/3 uncoated rate	14.5	10.9	52	31	59.6%
2/3 coated rate	14.5	7.8	38	29	76.3%

* Avg of 3 instead of 4 reps. One rep had unusually high numbers

1. In this test, all seeding rates produced a similar stand (29 to 31 plants/ft²)
2. Seedling success rate in this case was ~ 30% improvement with coated seed
3. Seed to seedling paradigm change with coated seed

3) Better imbibition/germination

Testing of one variety (RR Stratica)

- 4 treatments using one seed lot (5 reps)
 1. Raw
 2. Apron Nitragin Gold (ANG)
 3. 9% C w/ ANG
 4. 34% C w/ ANG

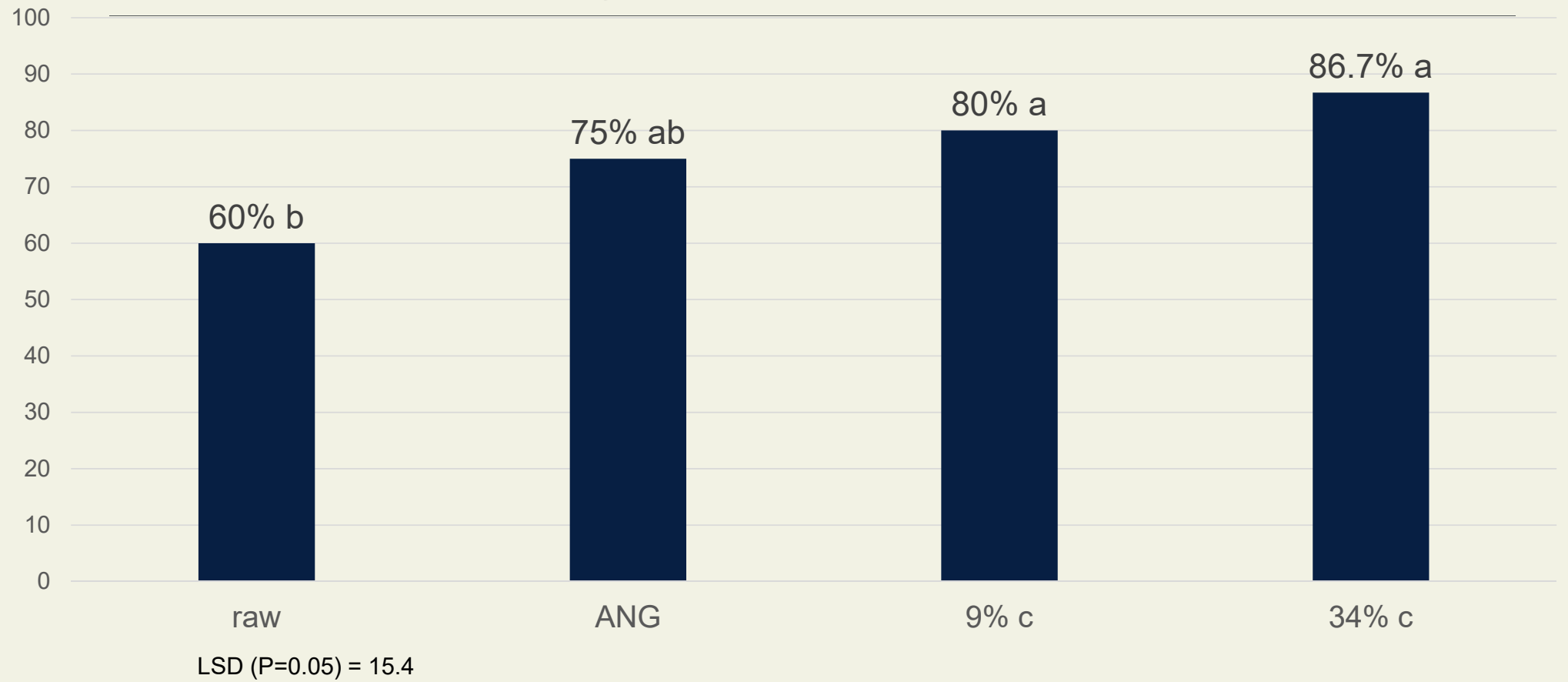


	Germination (EBDI)		
	Warm (%)	hard (%)	total (%)
UTC	82	9	91
ANG	79	12	91
9% c	79	12	91
34% c	80	10	90

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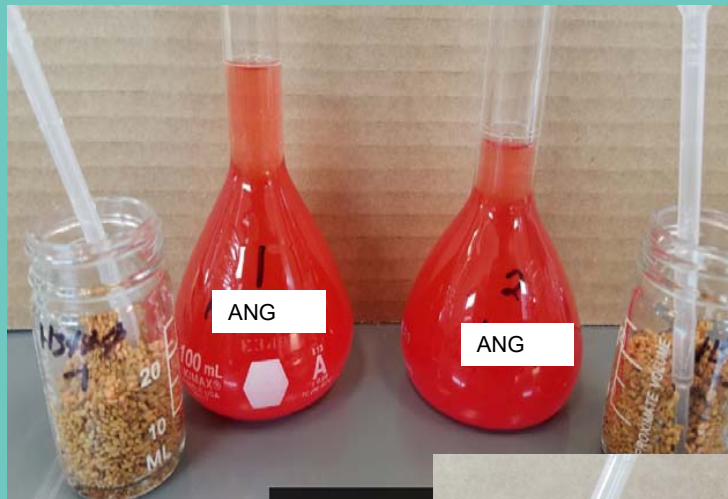
Potting Soil/Vermiculite Germ. Test – Limited Water

Avg: 5 reps of 12 seeds



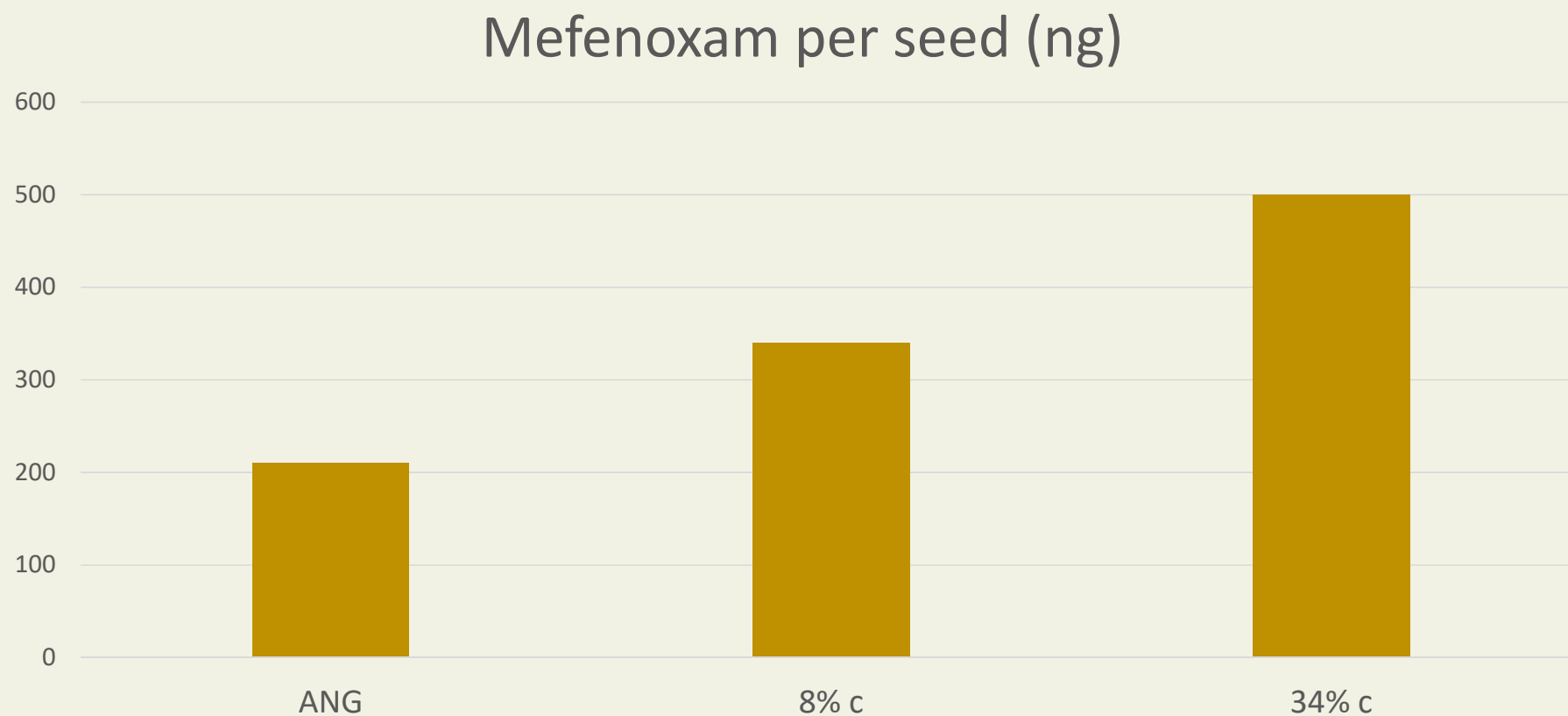
4) Higher seed treatment rate—Apron XL® Fungicide

- Does coated seed have more seed treatment than uncoated?



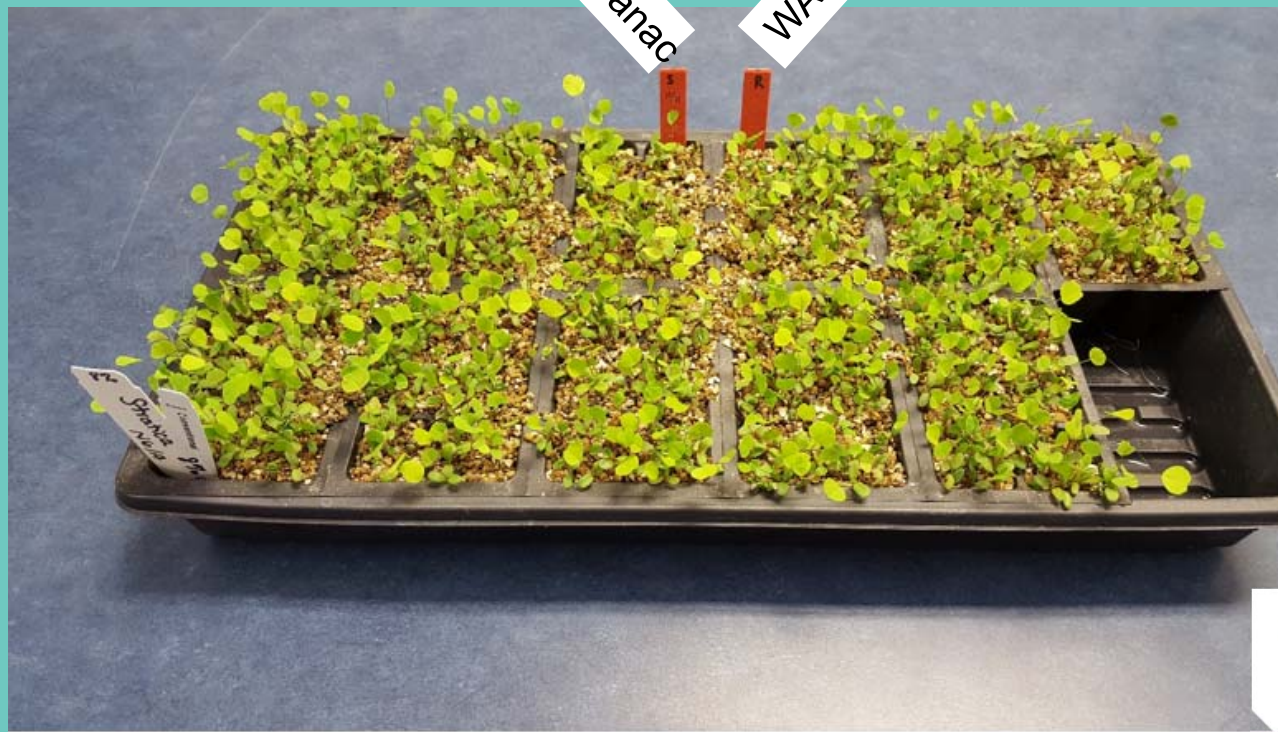
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Amount of Apron XL[®] Fungicide per Coating Level



5) Better vigor under disease pressure

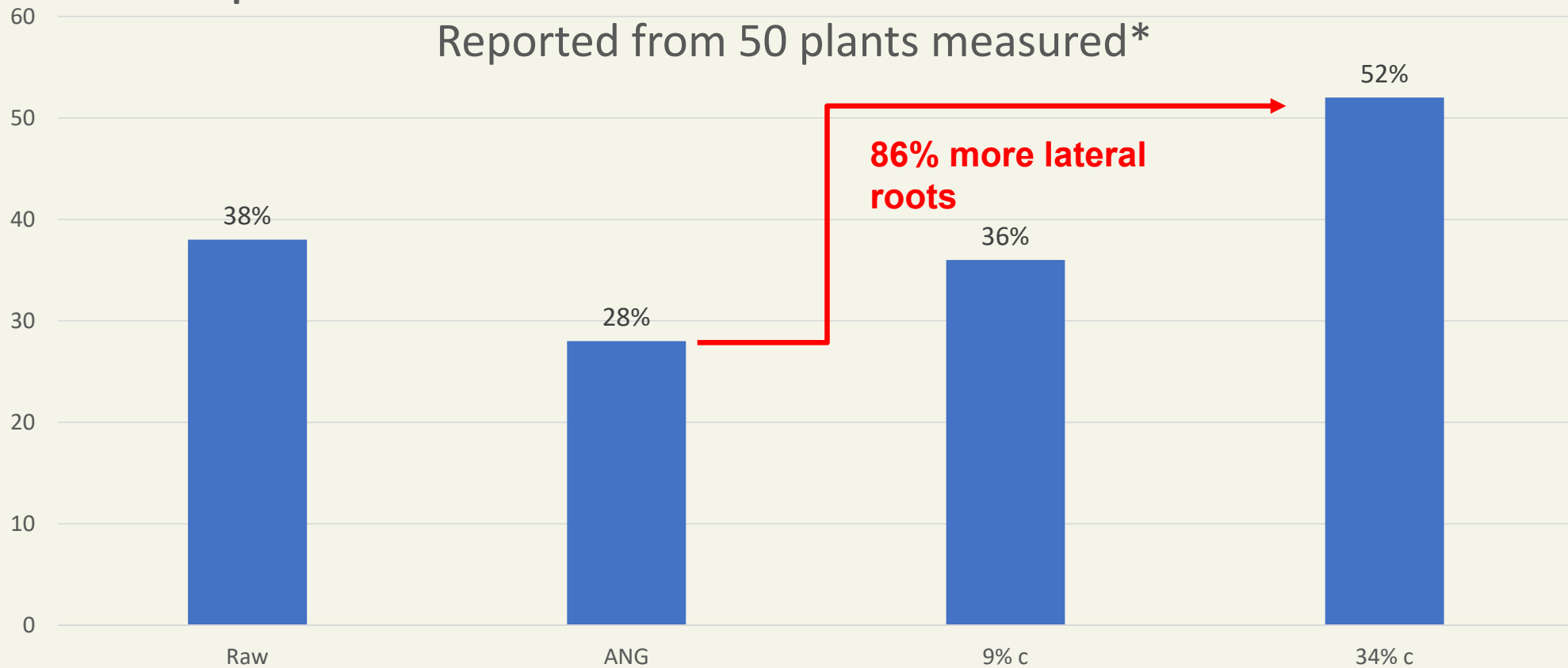
- Does increased seed treatment mean anything?
- FGI tested RR Stratica under *Aphanomyces* (multiple races) pressure
 - FGI work by Erin Pronschinske



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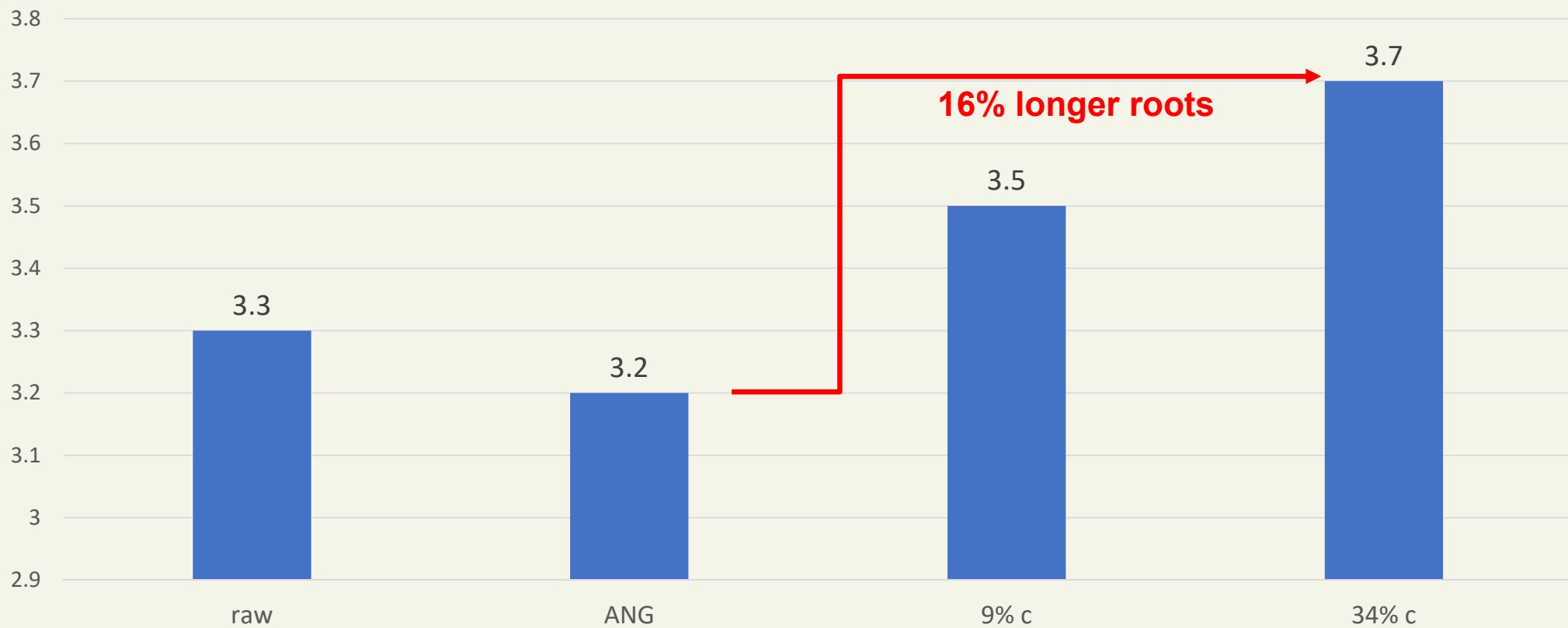
Percent of seedlings under *Aphanomyces* pressure with at least 2 lateral roots $\geq 0.5\text{cm}$

Reported from 50 plants measured*

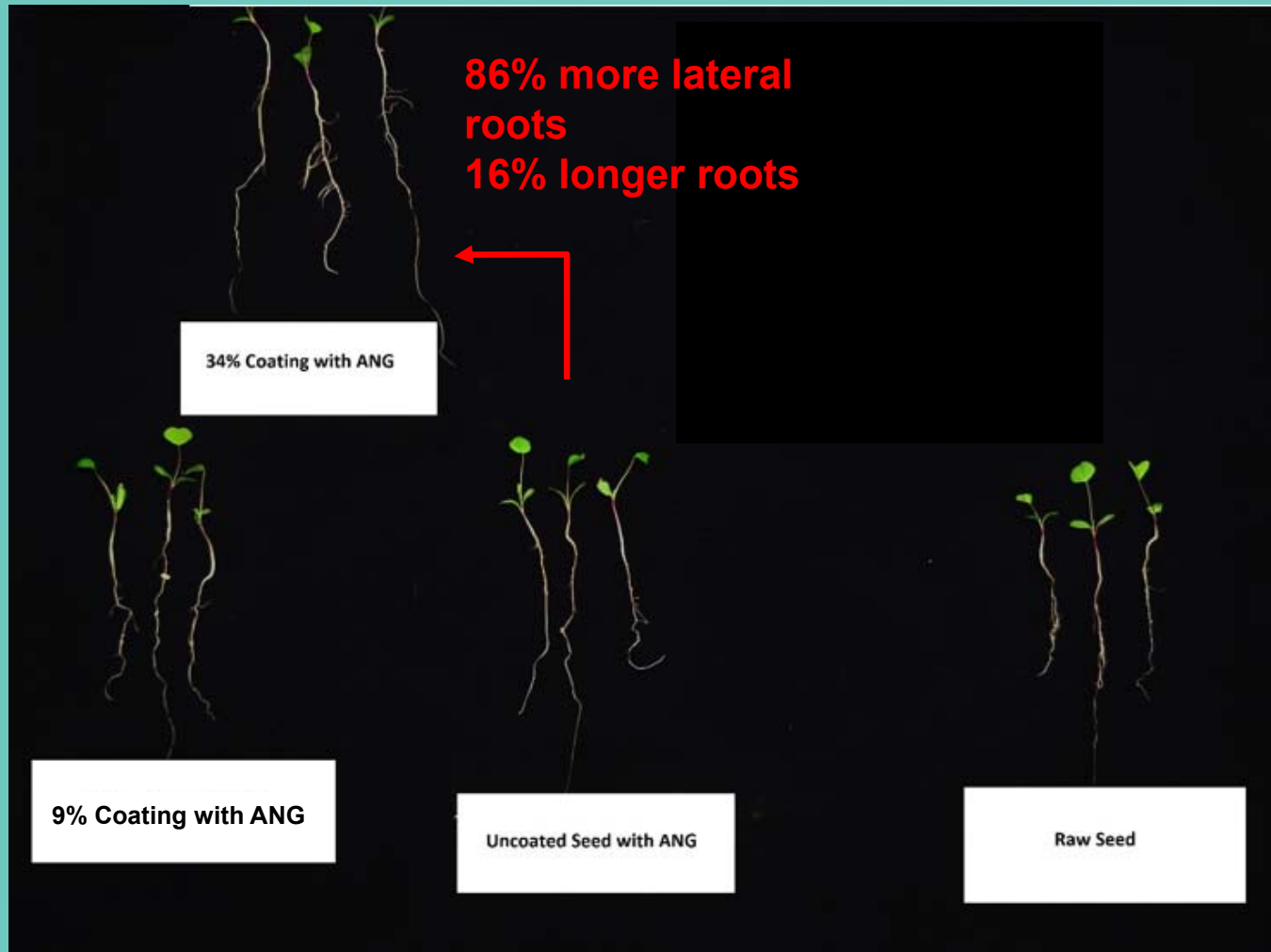


*Averages only: No statistics provided

Average root length (in.) under *Aph.* pressure
100 plants/Trt. measured



Representation of treatments (same seed lot) under *Aph.* pressure



6) Coating facilitates/enhances the addition of products

- Enhance treatments?
 - Alfalfa seed treated by wt.
 - Inoculant load
 - Close or bound to seed
 - Greater area
 - More complete seed coverage
- Can coating facilitate adding additional treatments?
 - In addition to basic fungicide and rhizobium, could include products such as Stamina® Fungicide, Ascend® PGR, or micronutrients that add more value
 - **Treatment #5 tested GroZone® Plus Advanced Coating® Zn 34% + Stamina®**
- Coated seed is used in a majority of high value seeds like vegetables to increase seed germination efficiency

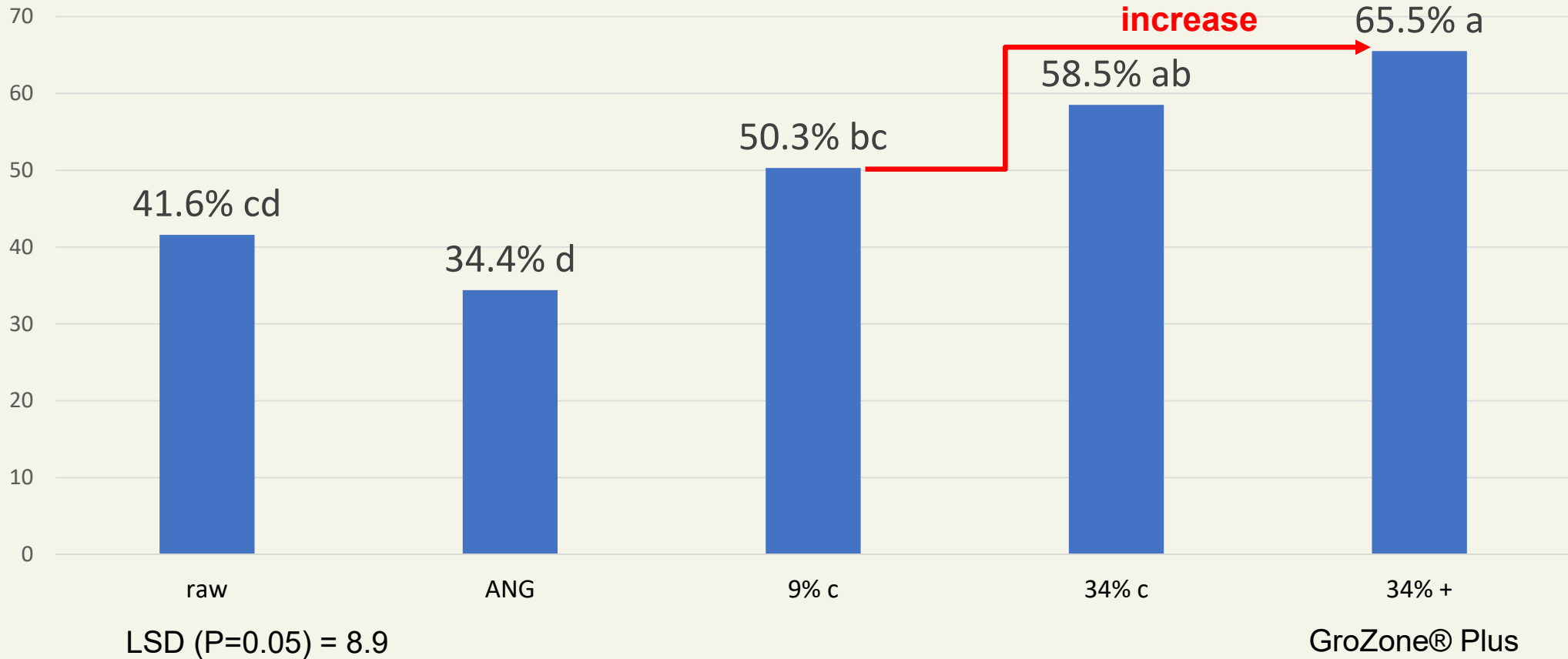


ANG

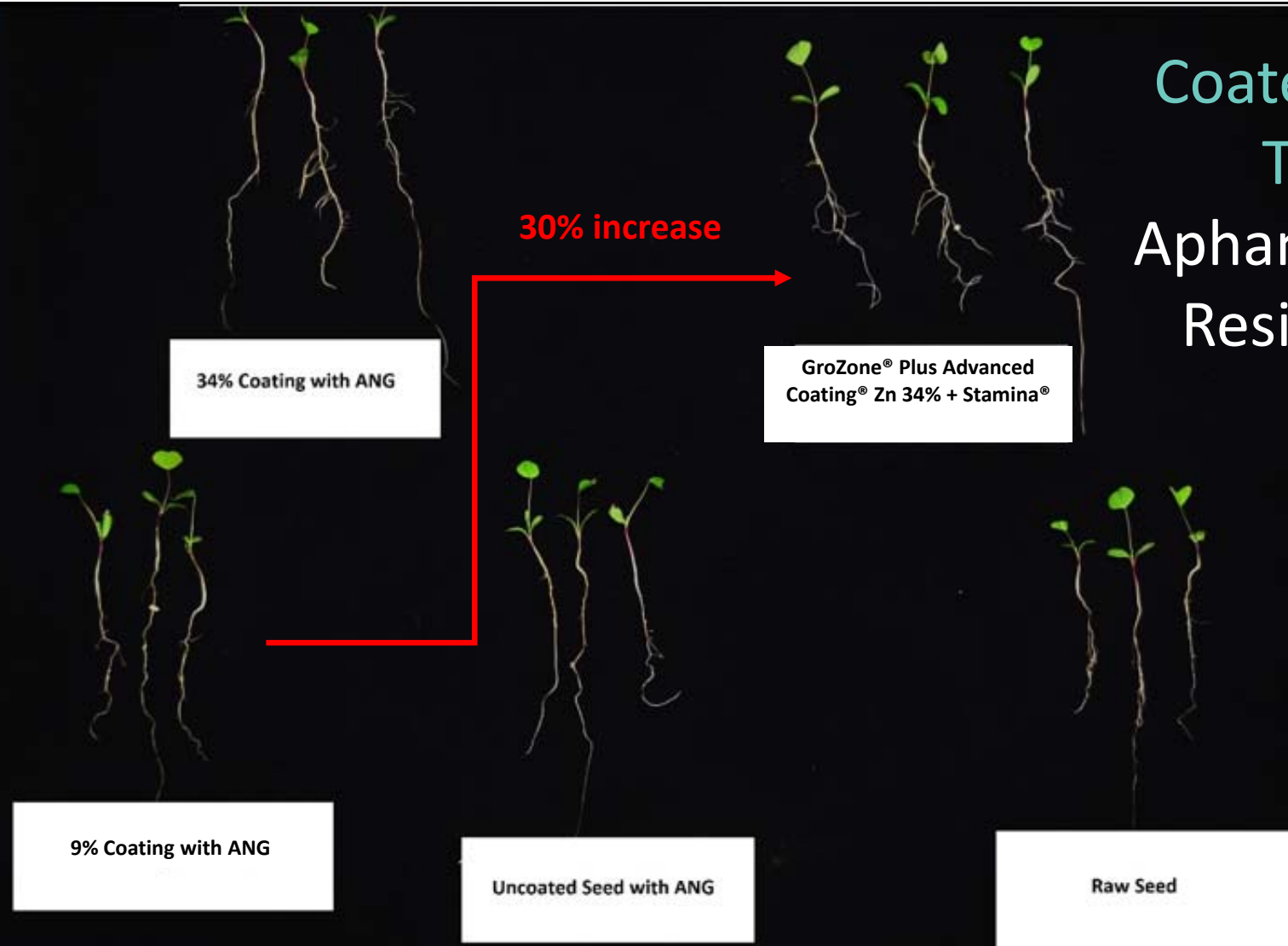
34%

Aphanomyces resistance (%) compared to susceptible and resistant checks

average of 4 reps



Coated Seed Test: Aphanomyces Resistance



Representation of treatments (same seed lot) under *Aph.* pressure

Coated Seed Benefits:
**GroZone[®] plus Advanced
Coating[®] Zn 34% + Stamina[®]**

Nitrogen-fixing rhizobium bacteria

Micros—Zn, Mn

Ascend[®] PGR

Apron XL[®] fungicide

Stamina[®] fungicide



CROPLAN[®]

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Coated Seed for Organic Hay Production

34% Coating

OMRI Listed and NOP approved
minerals and micronutrients

Nitrogen Fixing Rhizobia

An organic hydration component that
regulates water absorption for enhanced
germination and growth



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Why Sorghum Crop?

Less input costs: Seed, Water & Fertility

Less water requirement: 30-50% less water per ton grown vs corn

Excellent source of energy & digestible fiber for gain and milk

Yield & quality similar to corn....or better on tough, marginal acres



Types of Sorghums

Forage Sorghum

1. Single-cut silage, minimal regrowth potential
2. Larger, succulent, sweet stalks
3. High tonnage potential
4. Grouped as Early, Mid or Late season types for maturity

Hybrid Trait Options: Conventional, BMR, NEW Improved Quality (IQ), dwarf, brachytic, male sterile or combinations of these



Types of Sorghums

Sorghum x Sudan

1. Smaller stems for drydown
2. Very good regrowth and yield
3. Dry hay/baleage, grazing or chopped as silage
4. No set maturity groups, but they can put a head on; photo right

Hybrid Trait Options: conventional, BMR, brachytic, dwarf, Photoperiod Sensitive (PPS) and combinations of these



Types of Sorghums

Sudangrass

1. Smaller stems and slender leaves; very good drydown for hay
2. Excellent regrowth
3. Grazing or dry hay harvesting

Hybrid Trait Options: conventional, BMR, brachytic, Photoperiod sensitive and combinations of these.



Traits



1. BMR (Brown Mid-Rib)
2. Photoperiod Sensitive (PPS)
3. Brachytic (dwarf)

Cost Comparison (per acre) dryland

CORN SILAGE (\$180/UNIT)

Operation	Frequency	Cost
Prep & Plant	1	\$25
Fertility	1	\$120
Irrigation	20"	\$0
Insect Control	1	\$25
Weed Control	2	\$25
Disease Control	1	\$25
Seed Cost	30K pop	\$68

FORAGE SORGHUM (\$180/UNIT)

Operation	Frequency	Cost
Prep & Plant	1	\$25
Fertility	1	\$65
Irrigation	18"	\$0
Insect Control	2	\$?
Weed Control	2	\$35
Disease Control	1	\$0
Seed Cost	60K (4.0#)	\$14.40

\$148.6 per acre

\$288.00

\$139.40





In Summary

There are multiple factors and decisions that can impact the productivity of your forage. These have a direct effect on the ability to make consistent high quality feed.

Thank You!