

Reduced Lignin Alfalfa with Grasses

1st Production year

Hi-Gest 360 alfalfa + grasses

Seeding year

HarvXtra alfalfa + grasses

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2016 Production year data: Oneida & Wyoming Counties

Alforex *Hi-Gest360* reduced-lignin

Pioneer *55H94* highest yielding
in Cornell trials.

Adequate moisture vs. Drought

5 cuts in 2016

10 Grasses sown with Alfalfa

Tall Fescue

Bariane late maturing

Kora very high yielding

Meadow Fescue

Pradus late maturing

Liherold early maturing, high yield

BAR FpF32 high quality

10 Grasses sown with Alfalfa

Festulolium

Perseus ryegrass x meadow fescue

Orchardgrass

Barlegro late maturing

Command late maturing

Dividend VL very late maturing

DfIF47 sparse-heading type

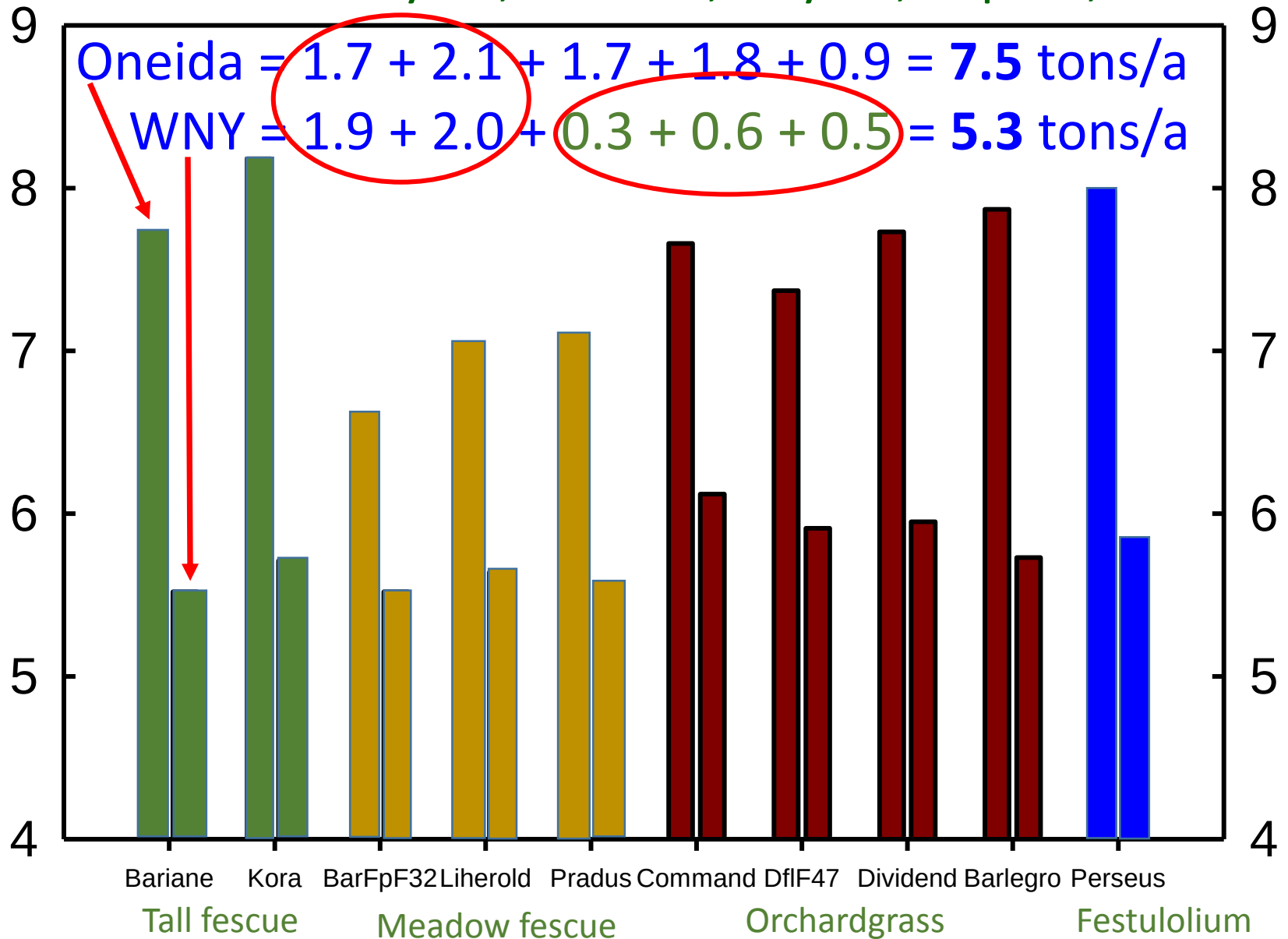
2016 DM Yield

5 Harvests: May 24, June 30, July 30, Sept. 3, Oct. 10

Oneida = $1.7 + 2.1 + 1.7 + 1.8 + 0.9 = 7.5$ tons/a

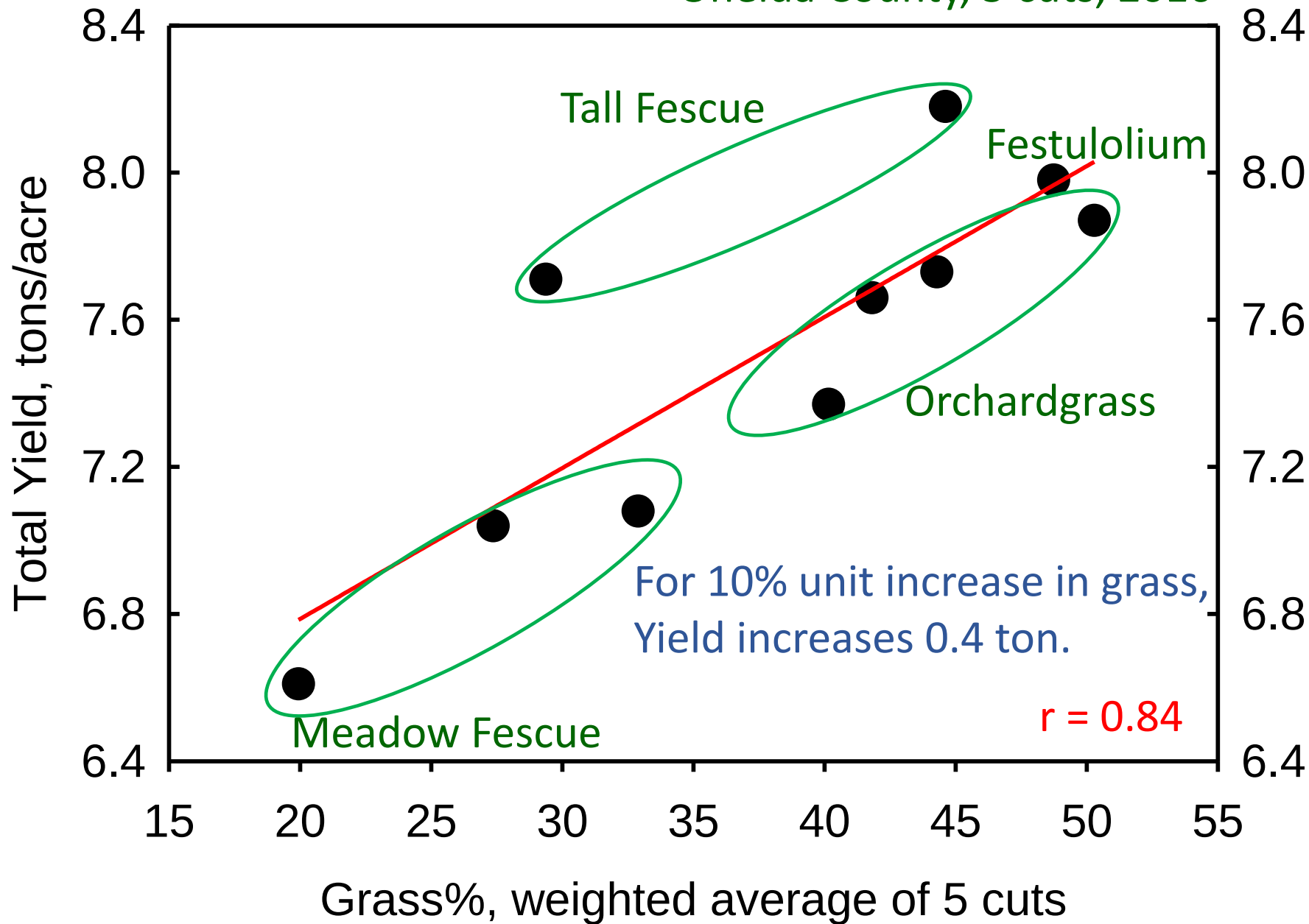
WNY = $1.9 + 2.0 + 0.3 + 0.6 + 0.5 = 5.3$ tons/a

Tons/acre, 5 cuts

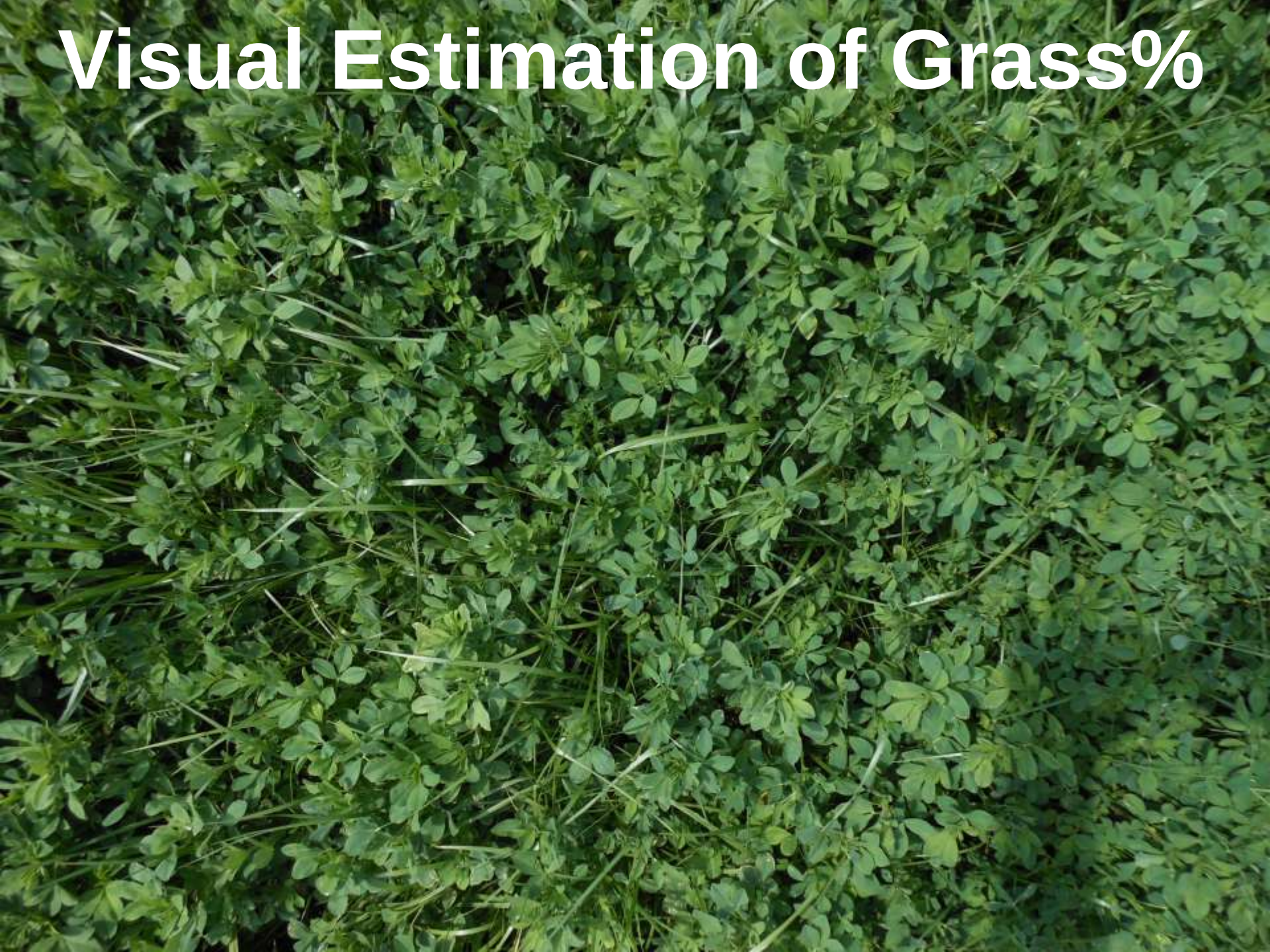


Yield is correlated with grass%, under normal growth conditions

Oneida County, 5 cuts, 2016

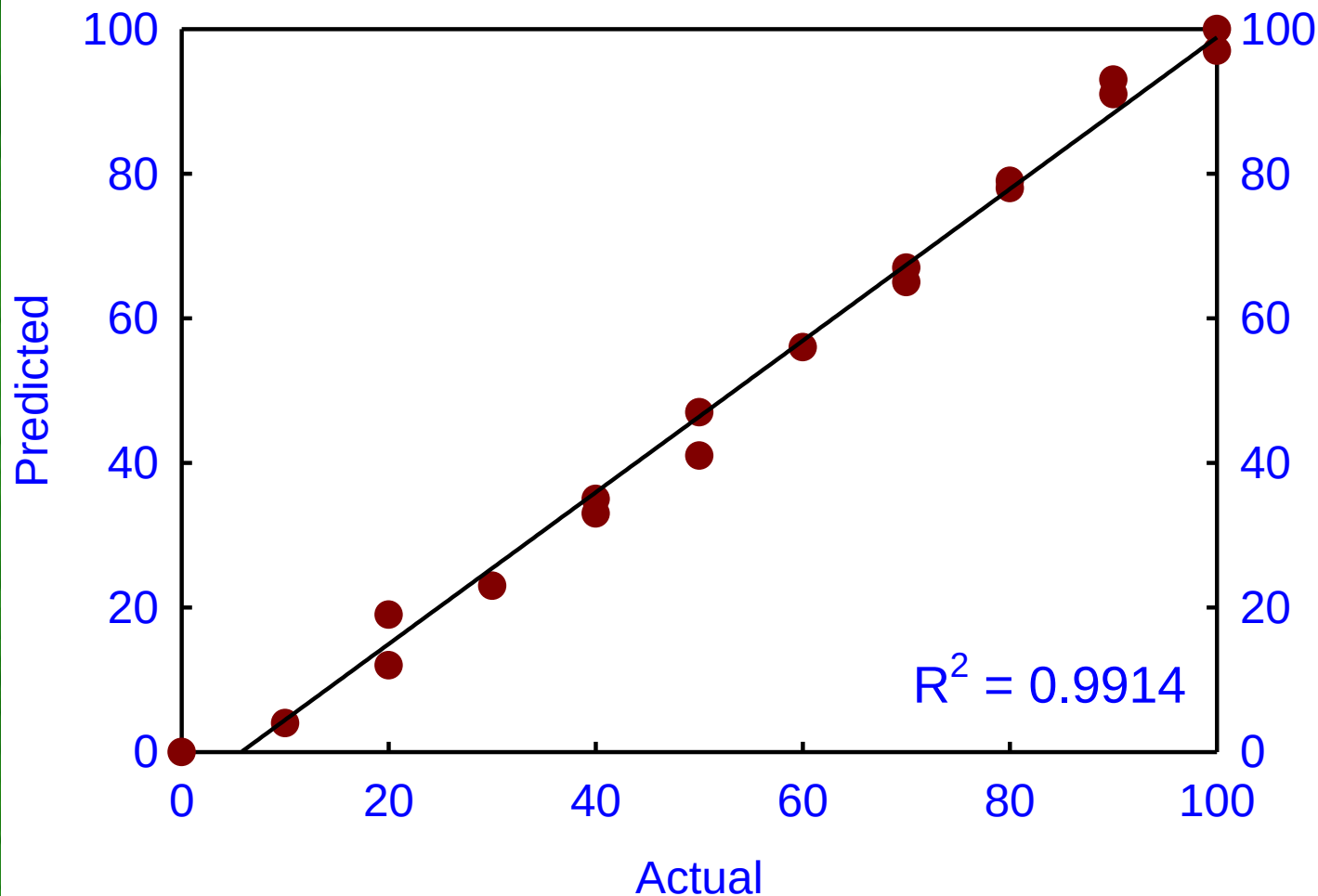


Visual Estimation of Grass%



Alfalfa-Grass Estimation

NIRS Grass% - DairyOne



Estimating stand composition of mixtures pre-harvest.

Take photo of mixed stand.
Analyze photo with AI software.
Estimate alfalfa %.

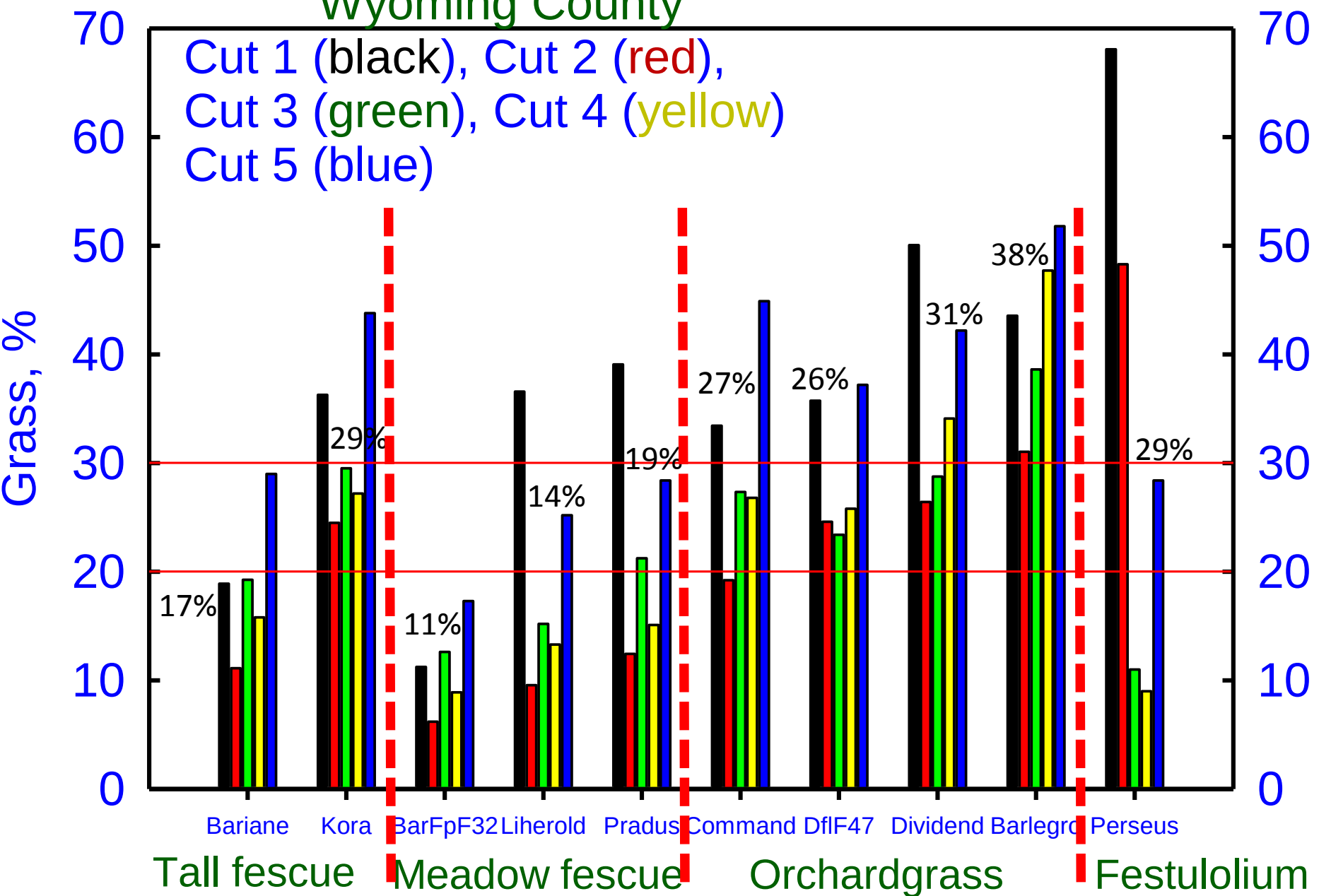
(% are weighed averages)

Grass %

Severe drought

Wyoming County

Cut 1 (black), Cut 2 (red),
Cut 3 (green), Cut 4 (yellow)
Cut 5 (blue)



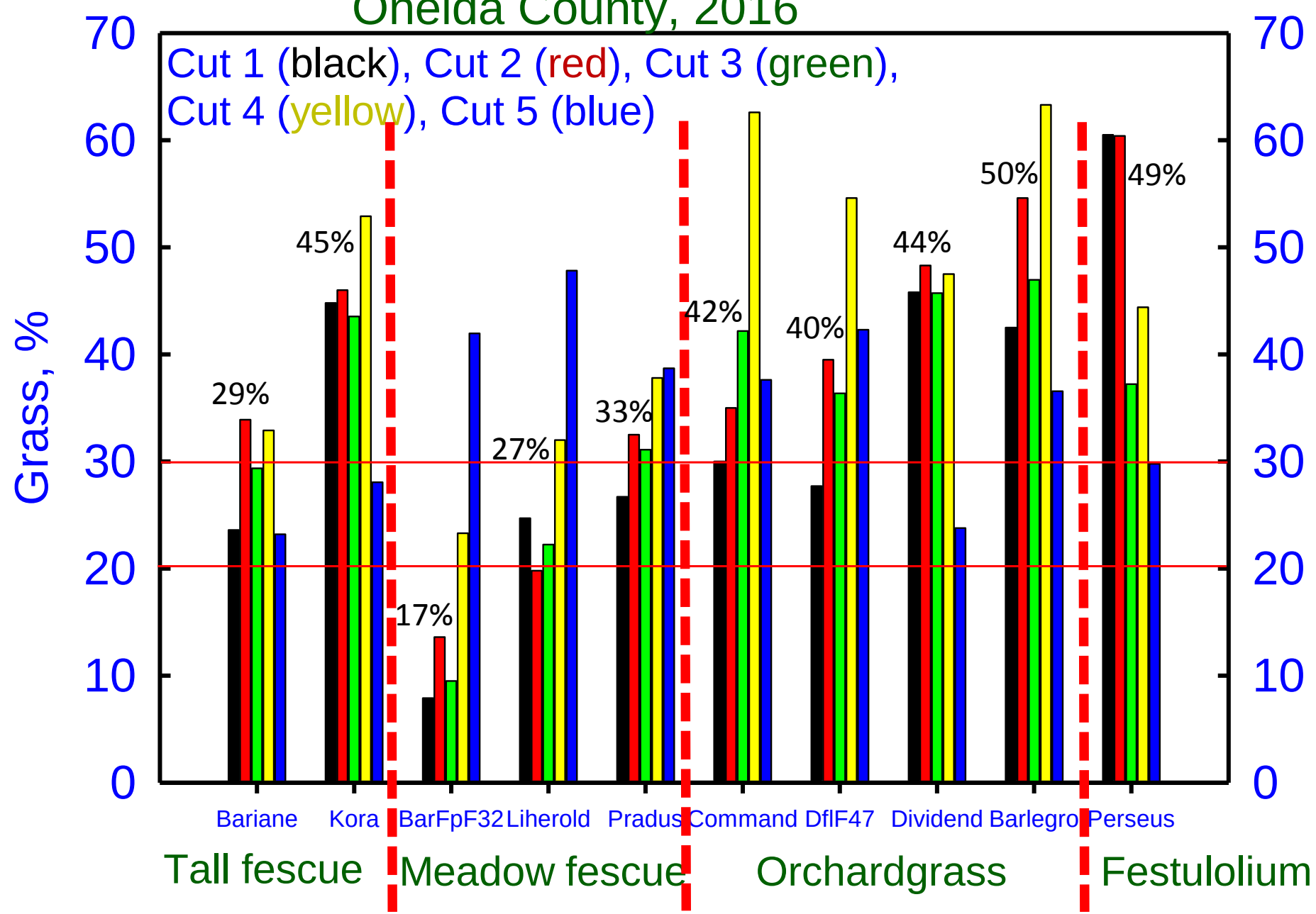
(% are weighed averages)

Grass %

Somewhat dry

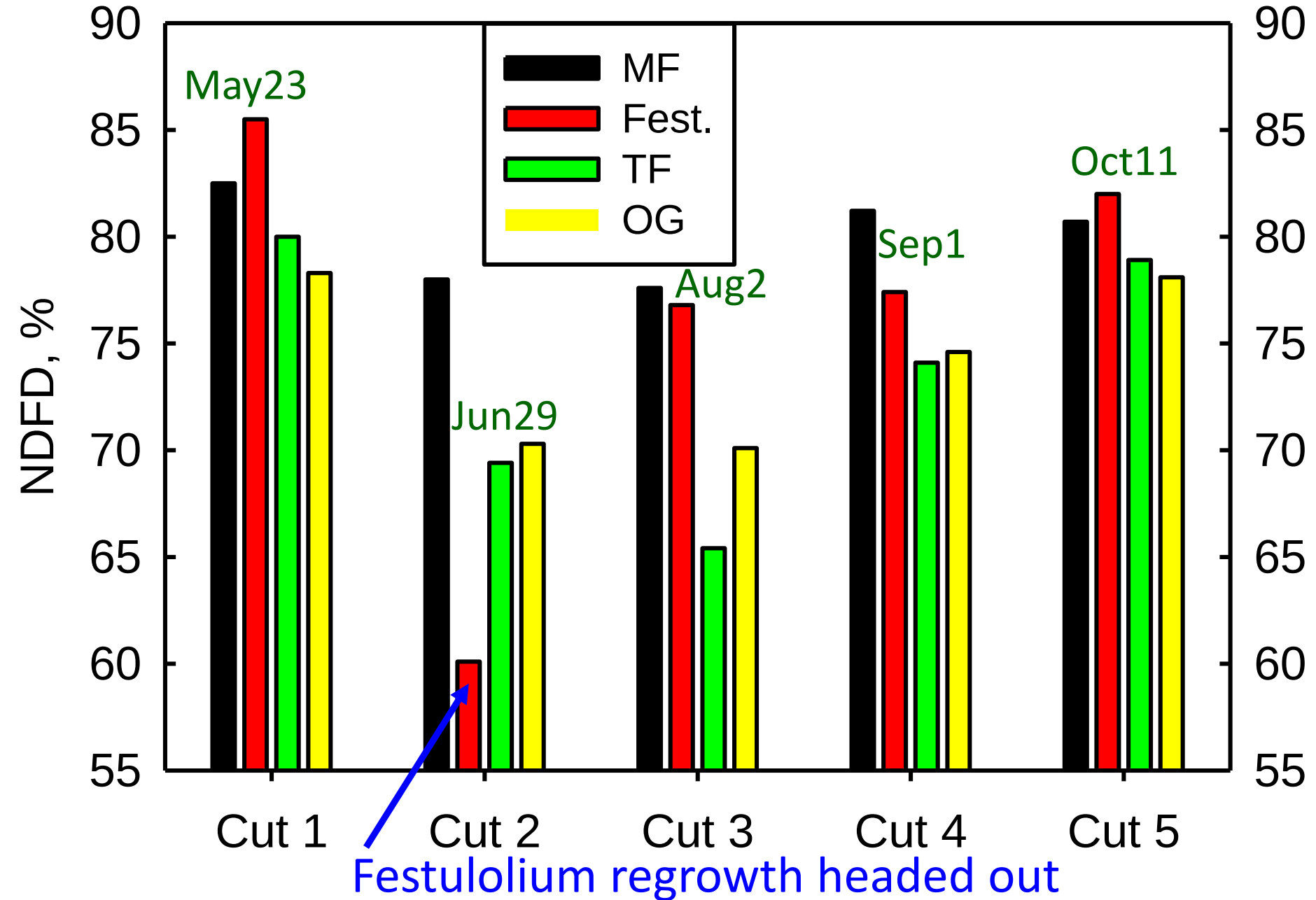
Oneida County, 2016

Cut 1 (black), Cut 2 (red), Cut 3 (green),
Cut 4 (yellow), Cut 5 (blue)



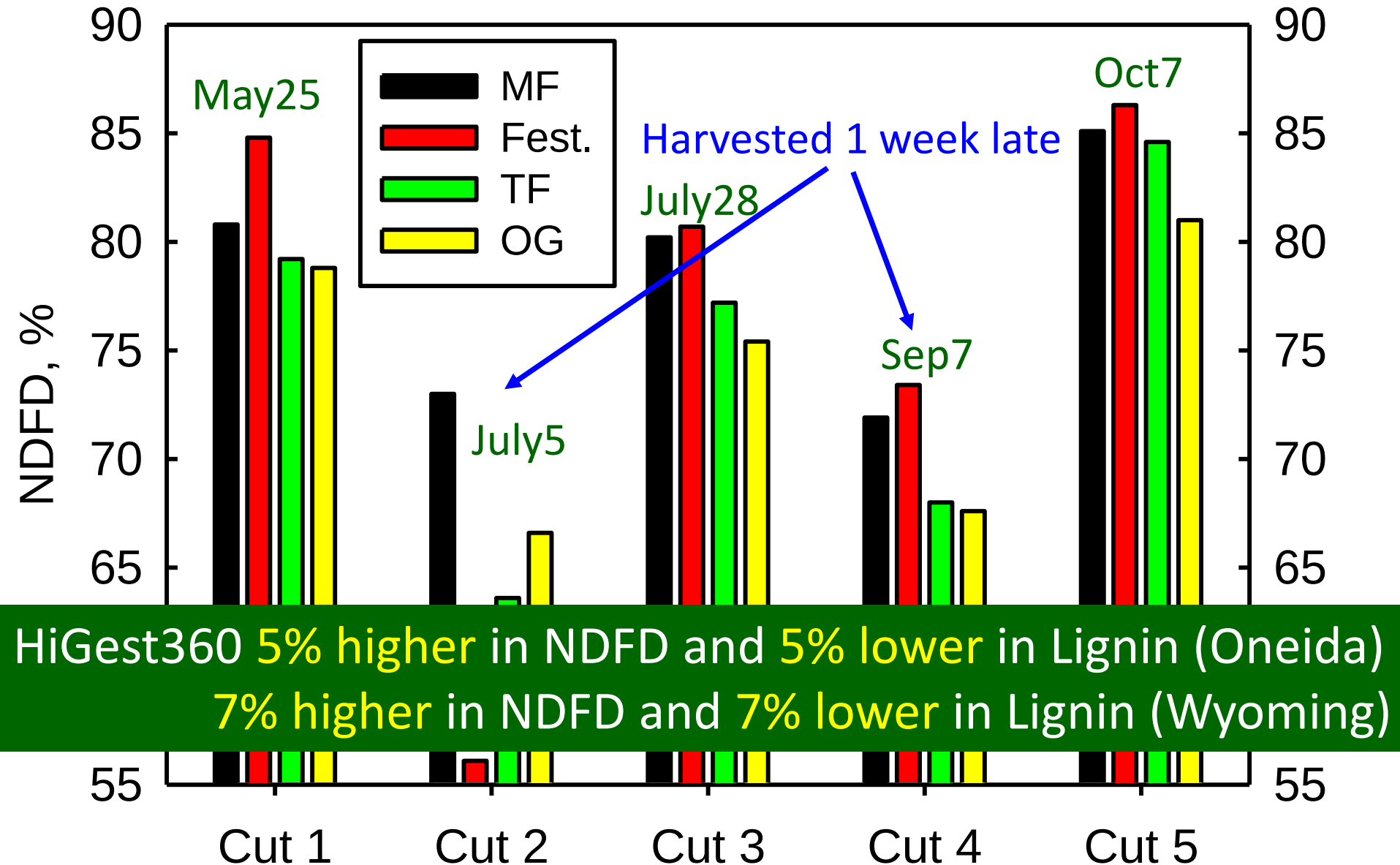
Grass Fiber Digestibility (NDFD)

Wyoming, 2016

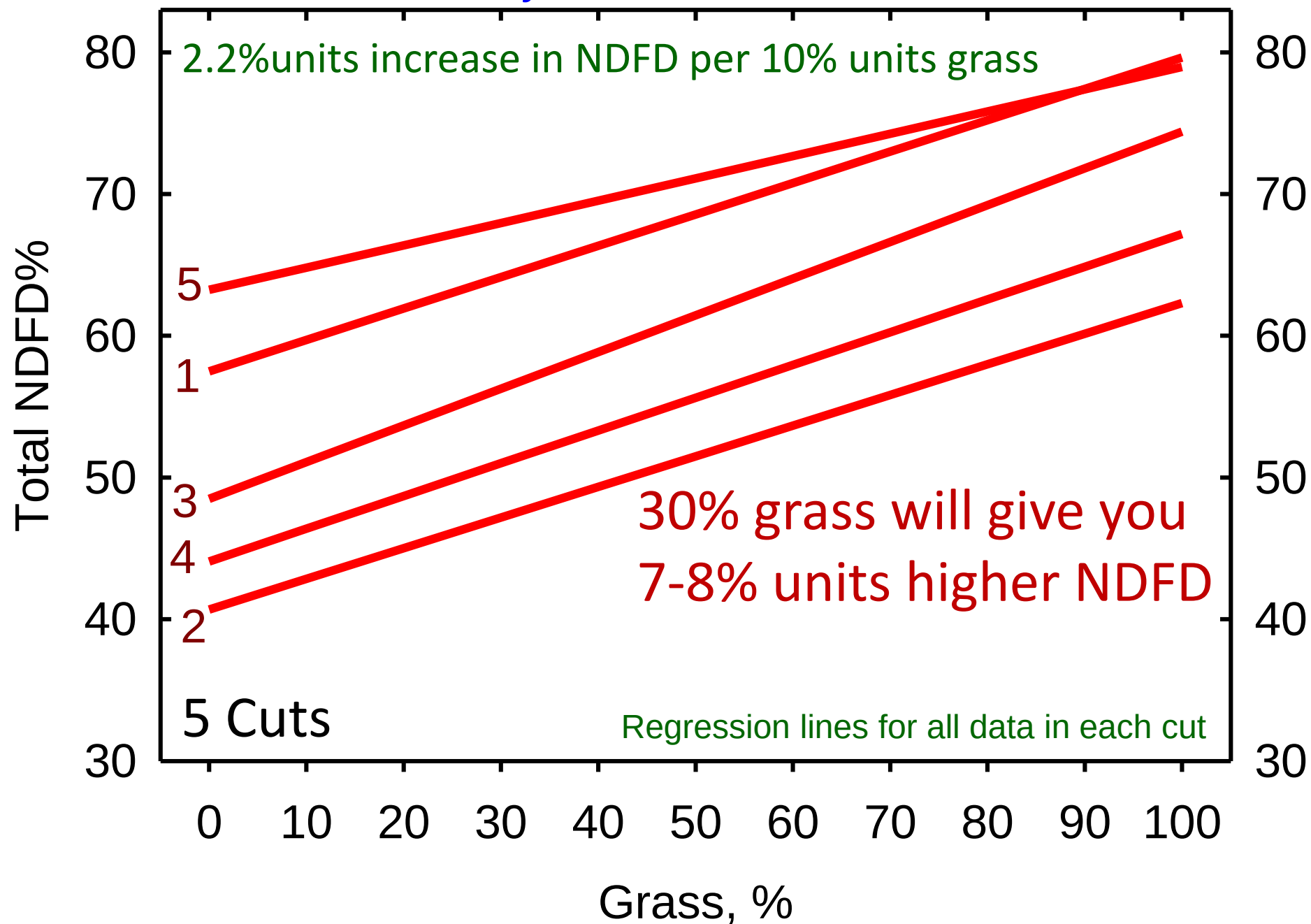


Grass Fiber Digestibility (NDFD)

Oneida, 2016



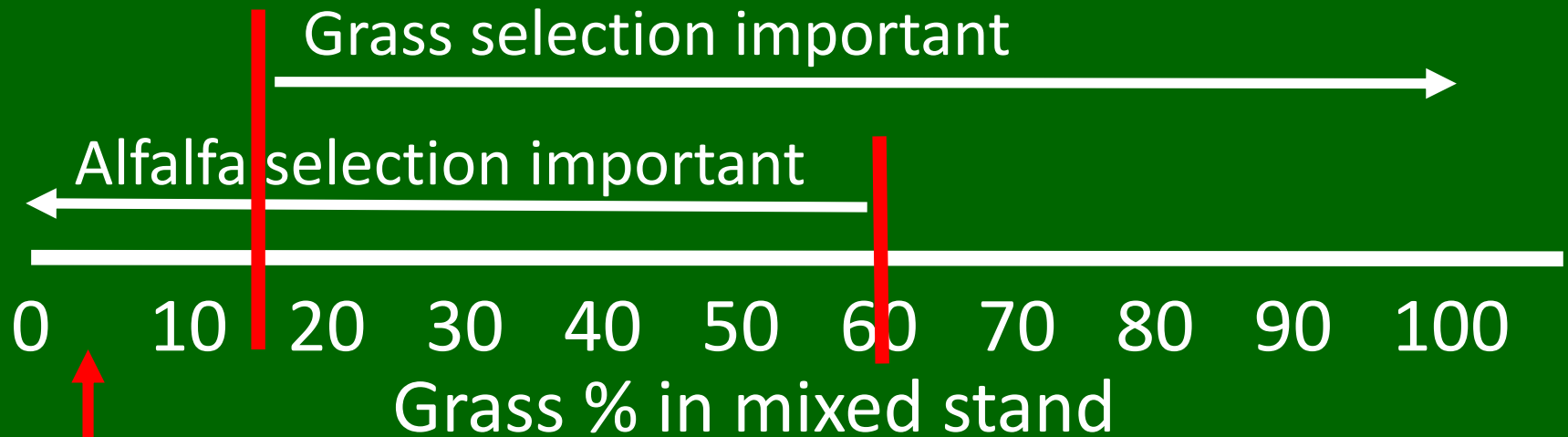
2016 Oneida County, Cuts 1-5, Total NDFD of mixtures



1%unit NDFD = 0.5 lb milk/cow/day



Impact of Variety selection on Fiber Digestibility of Mixtures (If 1% unit NDFD in a mixture is significant)



As low as 5% (any) grass will increase
NDFD of an alfalfa-grass mixture 1% unit.

Alfalfa 50% NDFD, Grass 75% NDFD

Lewis County, 2016 seeding

Entries - Alfalfa

HarvXtra ← Reduced lignin

Hi-Gest 360 ↙

LegenDairy XHD

Pioneer 55H94

Entries - Grass

Bariane TF

Fojtan festulolium (TF x ryegrass)

BAR FpF32 MF

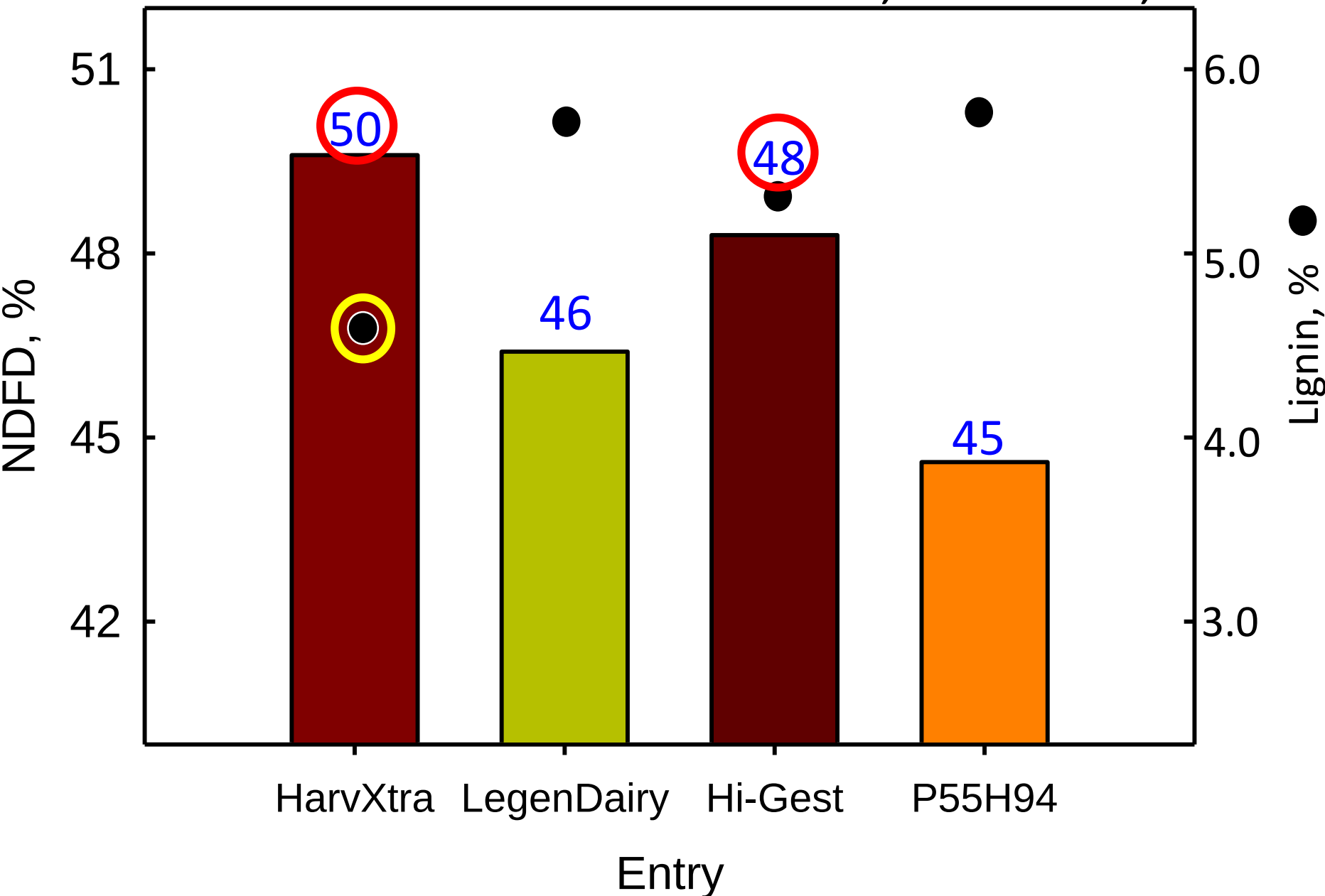
Dividend VL OG

DgLf47 OG

2 Cuts but pitiful 1st cut

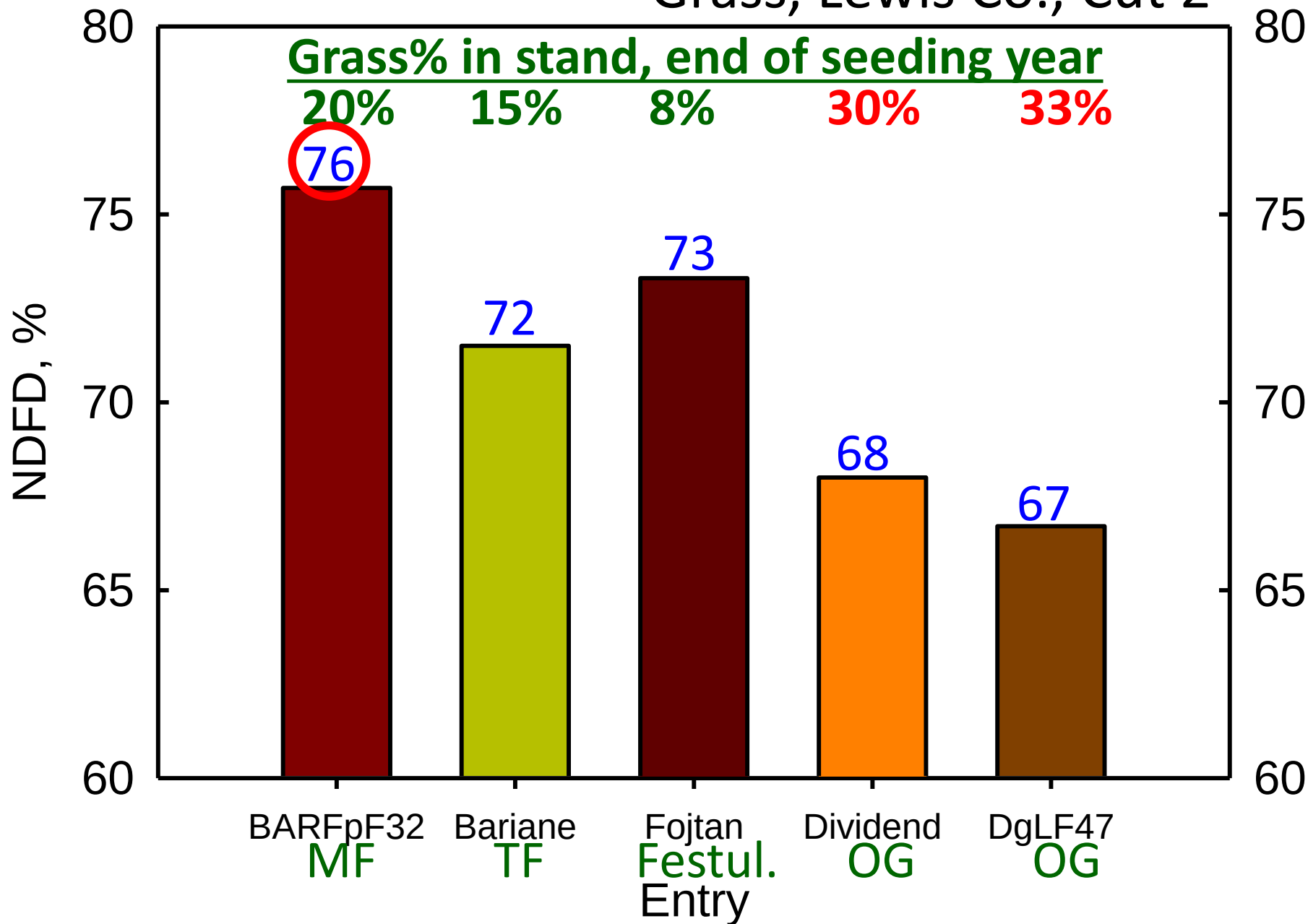
HarvXtra lower lignin than rest, similar in NDFD to Hi-Gest

Alfalfa, Lewis Co., Cut 2



MF higher NDFD than rest.

Grass, Lewis Co., Cut 2



Ithaca, 2016 seeding (USDA)

Alfalfa Entries

Hx2017 2017 'HarvXtra'

WL355RR (High quality check)

Grass Entries

BARFpF32 MF

Fojtan Festulolium

Dividend OG

Same study seeded in KY & MN



WL355RR

HarvXtra 2017

2016 seeding
Interaction of cultivar and drought

HarvXtra Air Seeding, northern NY, Spring, 2016



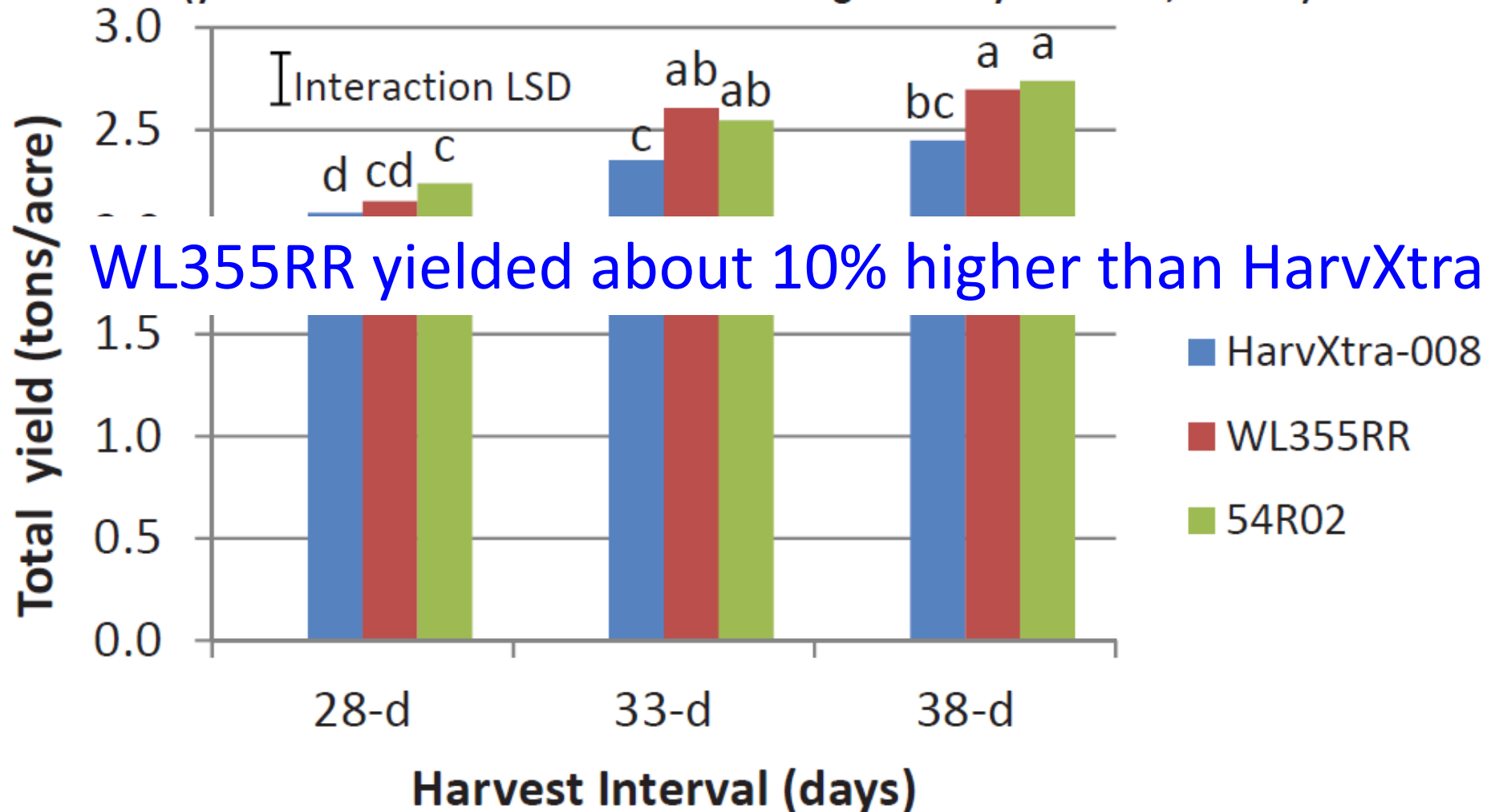
A person with short grey hair and sunglasses, wearing a black t-shirt with a red stripe and grey pants, is kneeling in a field of dense green alfalfa. They are looking down at the plants, with their hands near the base of a stalk. The field is lush and green, indicating healthy growth.

**Spring seeding
Ithaca, 2016
Severe drought**

**Fall 2016
Alfalfa cultivars looked similar,
WL yielded 10% more than Hx.**

Figure 4. Seeding year total yield of three cultivars on three cutting intervals (6-location average)

(yields with a common letter are not significantly different, $P=0.05$)



Pure Alfalfa stands

Sulc et al. 2016

Ithaca, 2016 seeding, USDA

Alfalfa Entries, NDFD

NDFD

Cut 2

<i>Hx2017</i>	52.7	7.5% higher
<i>WL355RR</i>	49.3	

Lignin

<i>Hx2017</i>	4.61	16% lower
<i>WL355RR</i>	5.53	

Ithaca, 2016 seeding, USDA

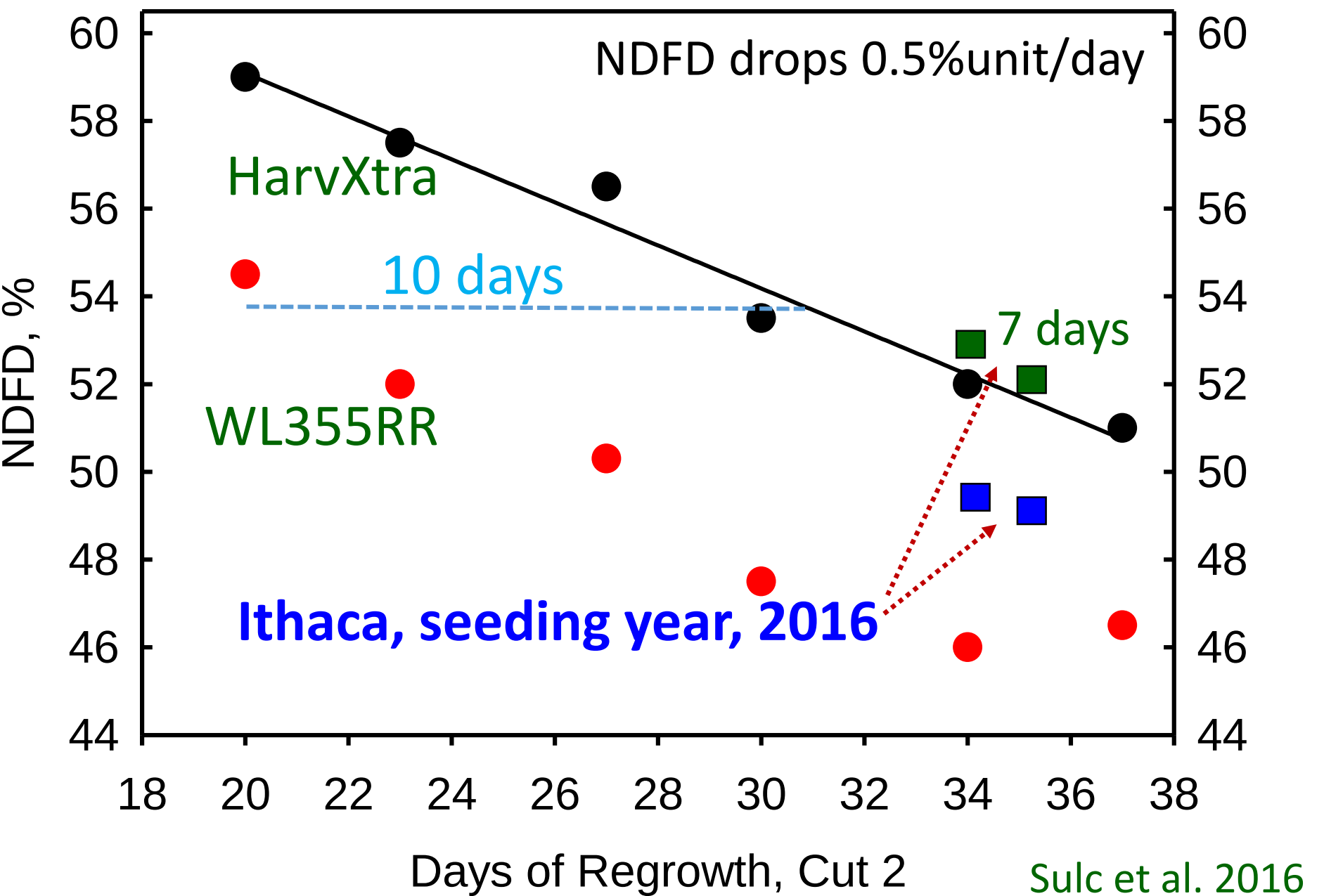
Grass Entries, NDFD (no Cut 1 grass)

NDFD

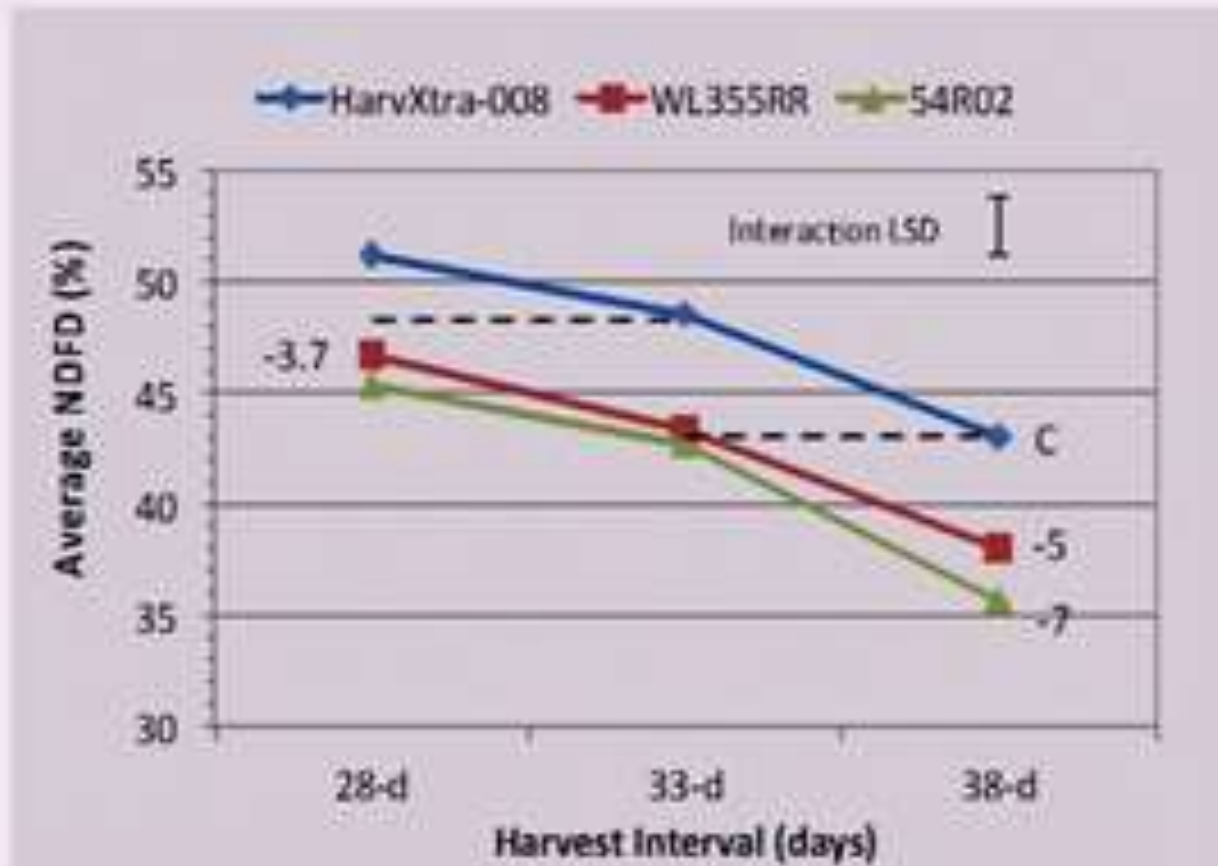
	<u>Cut 2</u>	<u>Grass%</u>
<i>BARFpF32</i> MF	76.5	9% MF
<i>Fojtan</i> Fest.	74.6	2% Fest.
<i>Dividend VL</i> OG	70.6	19% OG

MF 8% higher NDFD than OG

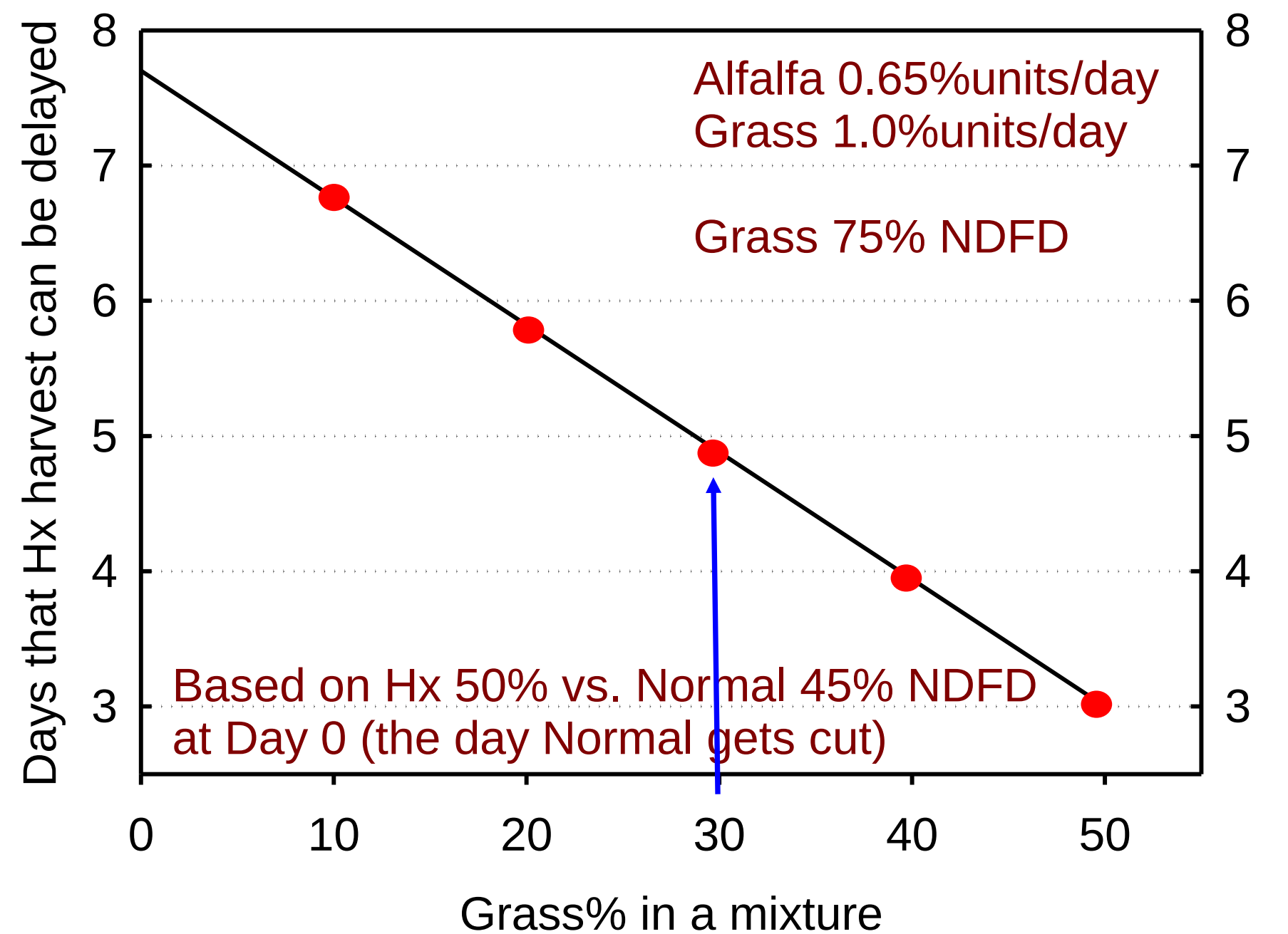
HarvXtra vs. WL355RR, 6 states, Cut 2 of seeding year, 2015



Effect of Harvest Schedules – 2016 NDFD (Ohio only)



How long can you delay HarvXtra harvest in alfalfa-grass mixtures?



HarvXtra & Hi-Gest vs. Check

12+ separate harvests

7-state average

HX vs. Pioneer

Lignin

14%↓

NDFD

7.5%↑

3-state average

HG vs. Pioneer

5.5%↓

5.6%↑

2-state average (FGI)

HX vs. Pioneer

22%↓

16%↑

HG vs. Pioneer

4.8%↓

5.5%↑

Conclusions

30% Meadow fescue/HQ Alfalfa:

1/3 to 2/3 more tons/acre

8-11% units higher NDFD in mixture

Festulolium & orchardgrass OK for beef.

5% (any) grass significantly increases
mixture NDFD.

Optimum grass%: Seeding Yr 5-15%
1st production yr 20-30%.

A close-up, slightly blurred photograph of a dense field of green vegetation. The plants appear to be a mix of tall grasses and low-lying weeds, creating a textured, layered appearance. The lighting is bright, suggesting daylight. In the center of the image, there is a semi-transparent green rectangular box containing the text "THE END" in white, bold, sans-serif capital letters.

THE END