

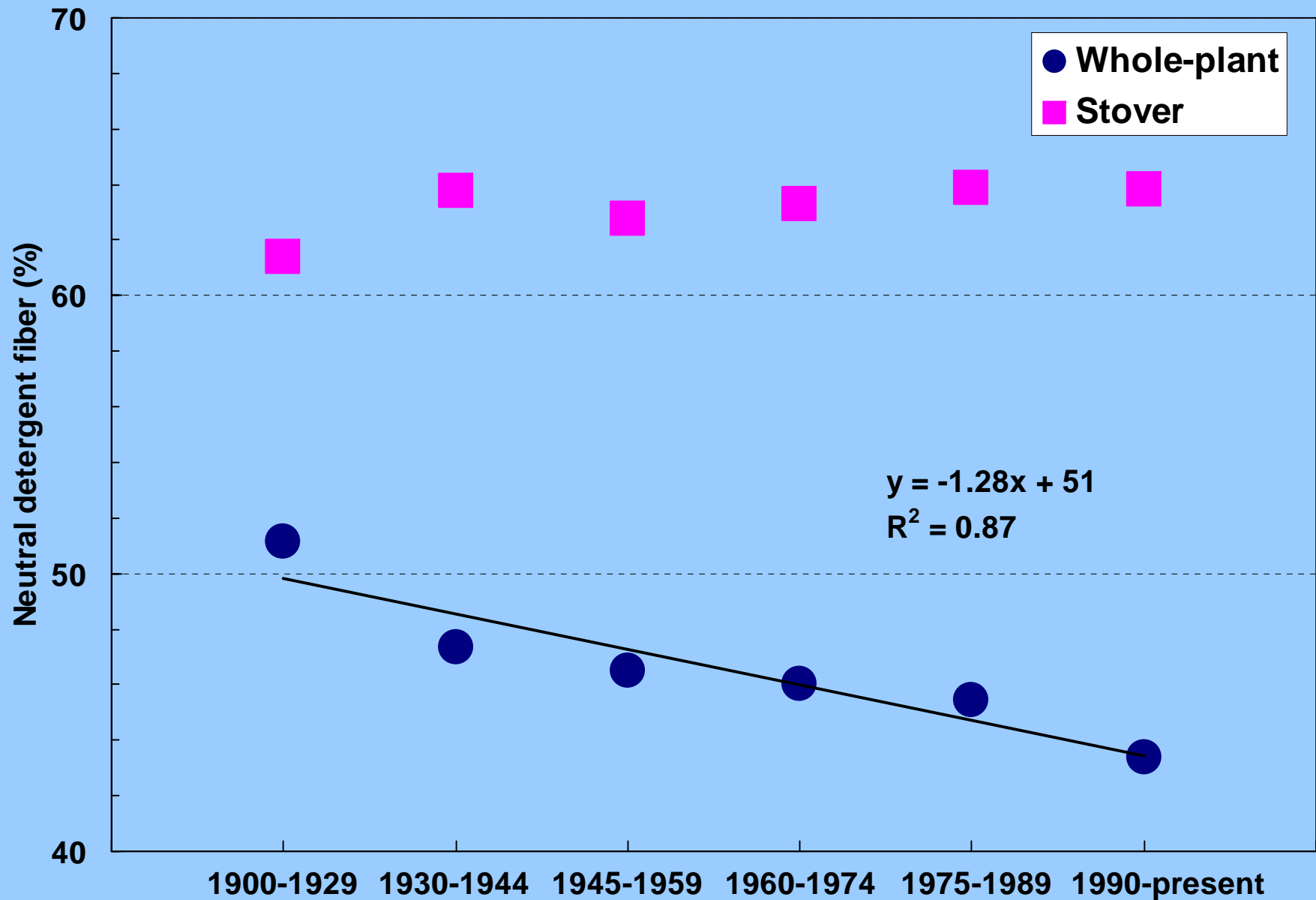
# **Managing for Corn Silage Yield and Quality**

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Miner Institute**

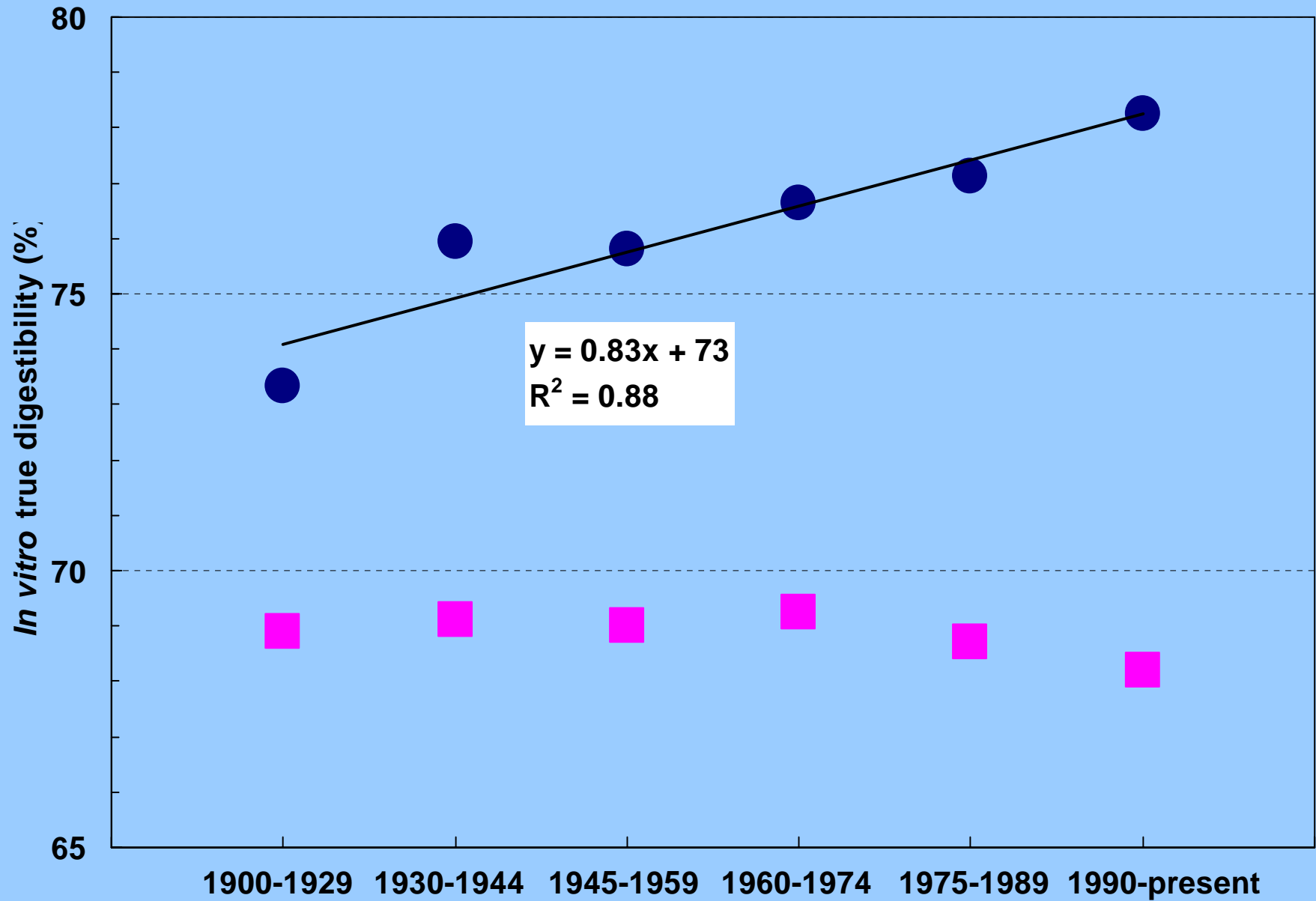
# Factors Influencing the Nutritional Value of Plants

- Plant species and part
- Stage of development
- Harvesting procedures
- Climate and weather
- Soils and fertilizers
- Disease and insect damage





**Relationship between corn forage neutral detergent fiber concentration and era of release for whole-plant and stover.**



**Relationship between corn forage *in vitro* true digestibility and era of release for whole-plant and stover.**

# Corn Hybrids for Silage

## Leafy hybrids

- About 15% of the corn silage seed market.
- Seed isn't premium-priced.
- A number of seed companies sell leafy hybrids.
- Up to twice as many leaves per plant.
- Few meaningful quality differences.
- One Univ. of Wisconsin study: +2 lbs milk/cow.
- Leafy hybrids have great sex appeal, and sex sells.

# Brown Midrib Hybrids

- The result of a naturally-occurring mutation, not a GMO. BMR has been known for over 50 years.
- This mutation results in incomplete lignin formation.
- Lower lignin means potential standability problems.
- Poor drought tolerance.
- 10-20% lower yield than most other hybrids.
- Very high seed price: 2x other hybrids.
- Relatively little benefit when fed to low-producing cows

# Brown Midrib Hybrids

- Higher digestibility than any other hybrid type.
- Especially useful in high forage diets.
- Positive milk responses even with cows milking over 100#.
- BMR is “your grandfather’s corn”, subjected to only about 10 years of genetic improvement.
- Newer hybrids appear to have less “yield drag”, perhaps 5-10% lower yield than non-BMR hybrids.





Brown Midrib corn  
Note brownish midribs



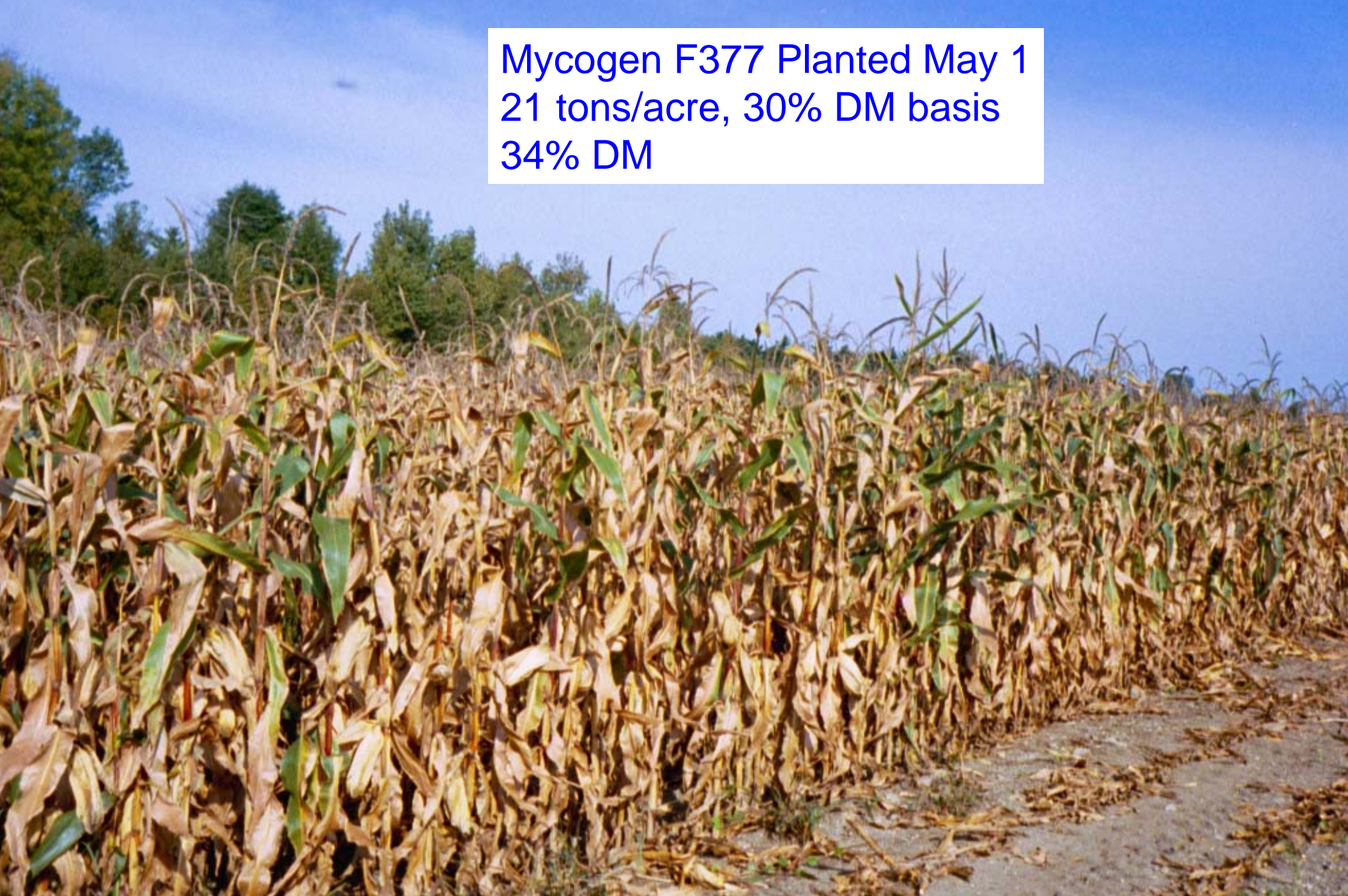


Mycogen F377 planted May 1  
22 tons/acre, 30% DM basis  
35% DM





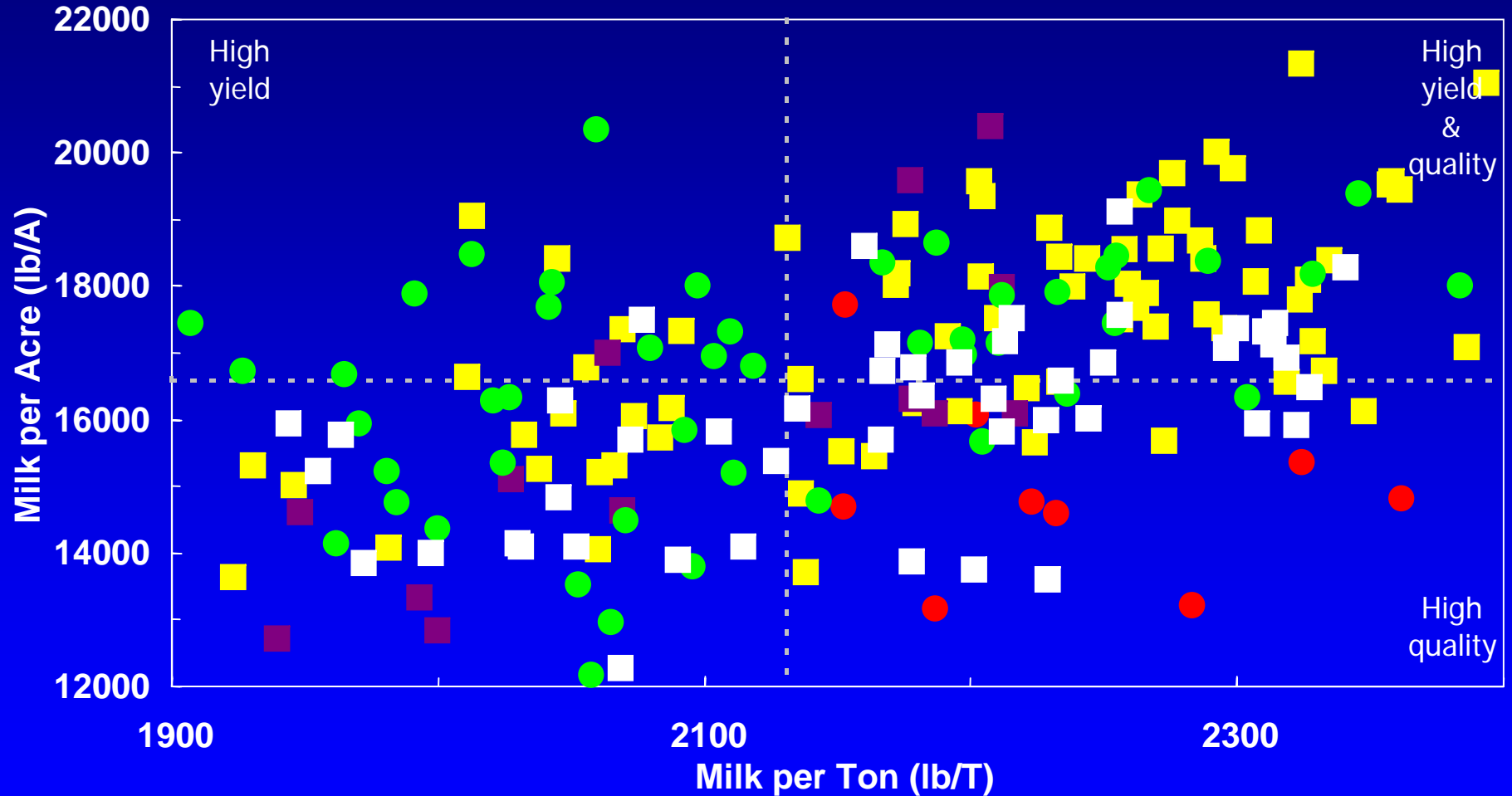
Mycogen F377 Planted May 1  
21 tons/acre, 30% DM basis  
34% DM



# High NDF + High NDF-d Hybrids

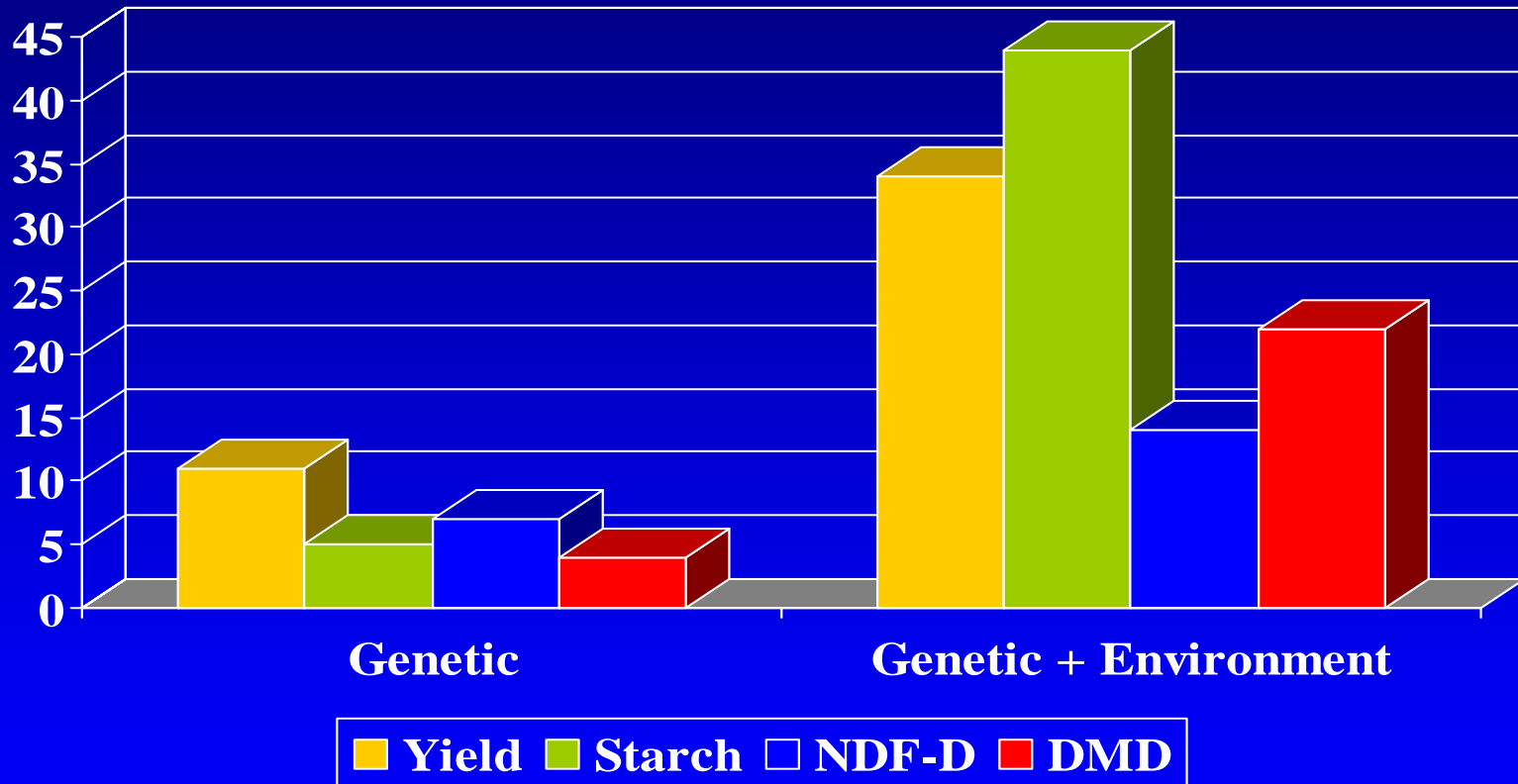
- Silage only.
- Most are leafy hybrids (Leafy gene.)
- Some are premium priced (150% of normal), others are not.
- Low ear-to-stalk ratio—big plant, not a big ear.
- Potential problem: Boom or bust, depending on the growing season weather.

# Corn Specialty Hybrid Silage Yield and Quality Wisconsin, 1990-1999

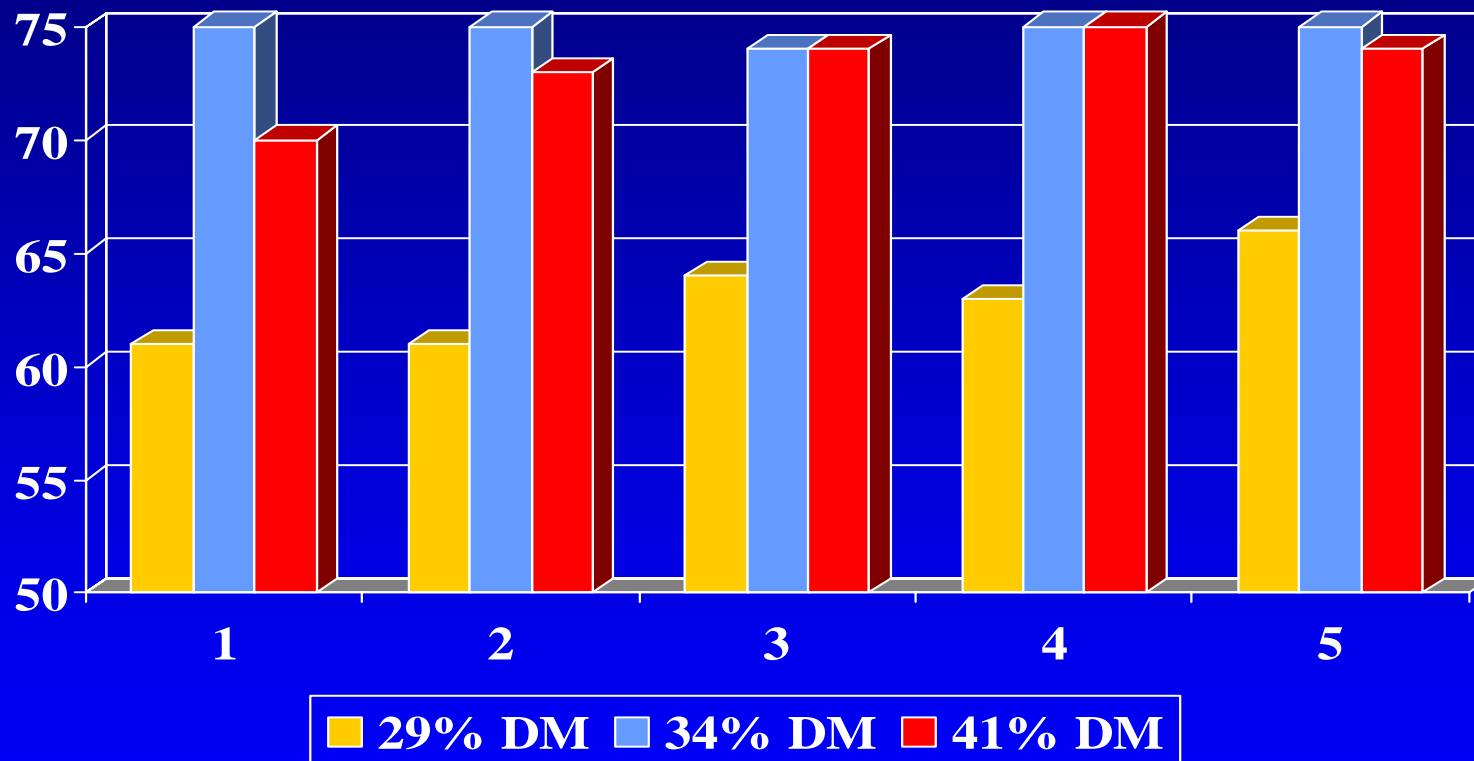




# Factors Influencing Corn Silage Quality



# Effect of Maturity on Corn Silage Dry Matter Digestibility





# Using “Milk 2000” to Evaluate Corn Silage

- “Milk 2000”: Spreadsheet using forage analyses and dry matter yield to predict milk production.
- Forage analyses include *in vitro* NDF-d, CP, NDF, ash, & starch.
- Separate equations for corn silage and alfalfa.
- Results: Milk per Acre & Milk per Ton.
- Good for comparing hybrids or practices within a field, but not between farms or between years.

# What is Corn Silage Quality Worth?

(Assumes milk is \$12.00/cwt)

<b>NDF-d</b>	<b>NEL</b>	<b>Milk, Lbs/T DM</b>	<b>Milk, \$/T DM</b>	<b>Milk, Lbs/A</b>	<b>Milk, \$/A</b>
<b>Low</b>	<b>0.75</b>	<b>3572</b>	<b>\$429</b>	<b>25004</b>	<b>\$3000</b>
<b>Ave.</b>	<b>0.77</b>	<b>3682</b>	<b>\$442</b>	<b>25777</b>	<b>\$3092</b>
<b>High</b>	<b>0.79</b>	<b>3864</b>	<b>\$464</b>	<b>27046</b>	<b>\$3246</b>

# Corn Maturity vs. Milk Production

(Milk @ \$12.00/cwt)

DM %	Milk, lb/ton DM	Milk, \$/ton DM	Milk, lb/acre	Milk, \$/acre
25	3309	397	21510	2581
30	3435	412	24050	2886
<b>35</b>	<b>3530</b>	<b>424</b>	<b>26472</b>	<b>3177</b>
40	3122	375	23412	2809
45	2970	356	20791	2495

Milk price \$10.50/cwt.

# Harvest Management: High Chop Corn Silage

- Considerable research on chopping at 12", 18", 24" and 30" height (vs. normal 6-8").
- Advantages:
  - Chop height decisions delayed until harvest .
  - No additional cost.
  - Works with most hybrids—but not BMR.
  - Wisconsin research shows +2 lbs milk/cow.
- Disadvantages:
  - Reduced yield.
  - Only small improvements in digestibility?





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# Summary

- Corn silage has increased in yield and quality, but mostly in yield.
- Yield has been increasing for almost 100 years, mostly due to higher grain yield.
- Most of the quality increase has been from a higher grain-to-stalk ratio.
- Very little change in the average stover NDF concentration or digestibility of dual-purpose hybrids.
- However, there are some dual-purpose hybrids with high stover digestibility, and some silage-only hybrids with consistently superior digestibility.





# Keys to High Quality Corn Silage

- **Hybrid selection**: Choose hybrids with good yield and high fiber digestibility. Both dual purpose and silage-only hybrids can meet these criteria.
- **Proper maturity** (hybrid maturity + planting date + harvest date) is often more important than genetics.
- **High populations** are important: 30,000-33,000 plants/acre. Plant enough to allow for 10% seed mortality.
- **Delay feeding new-crop corn silage** for at least 1 month, preferably 2-3 months.

