

# **Does Overseeding Improve Alfalfa Stand Persistence and Yield?**

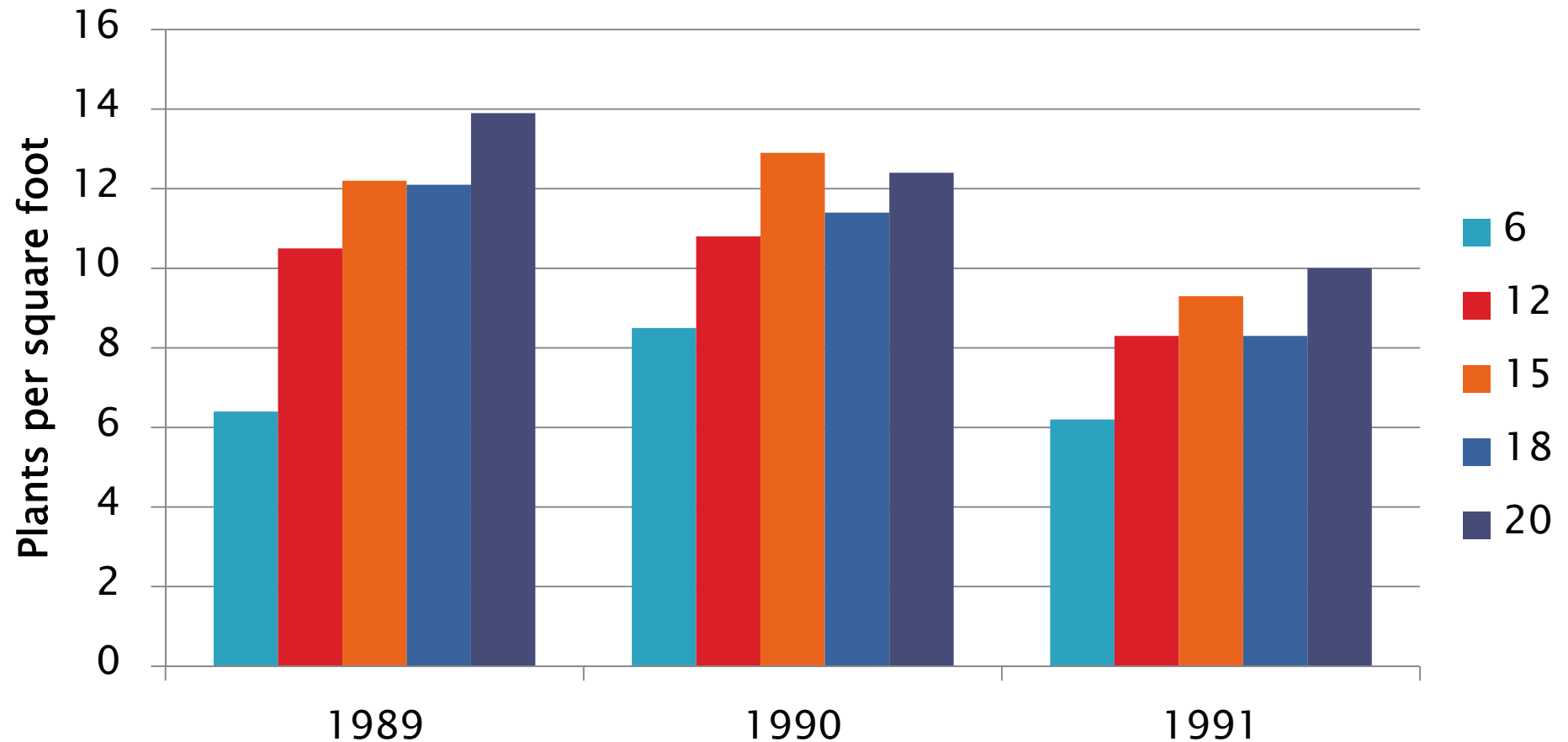
Dr. Dan Undersander  
University of Wisconsin

# Overseeding Definitions

- ▶ 1) Higher initial seeding rate
- ▶ 2) Seeding into existing alfalfa fields

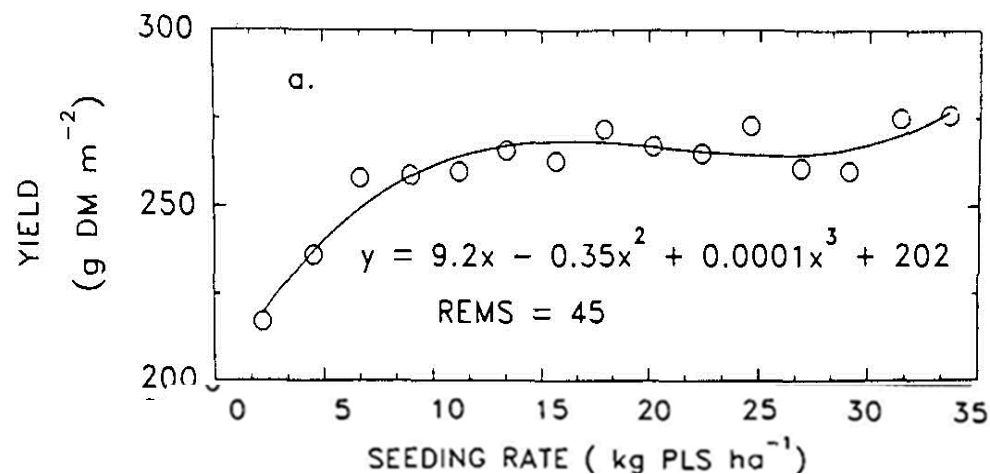
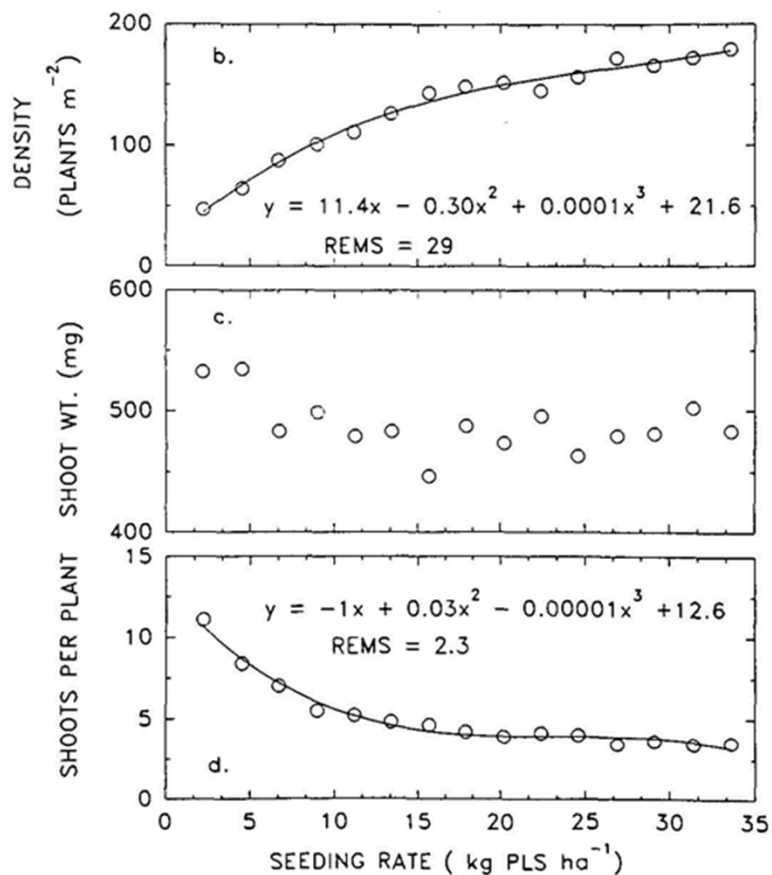
# Alfalfa stand at several seeding rates

Appleton, alfalfa seeded 1989



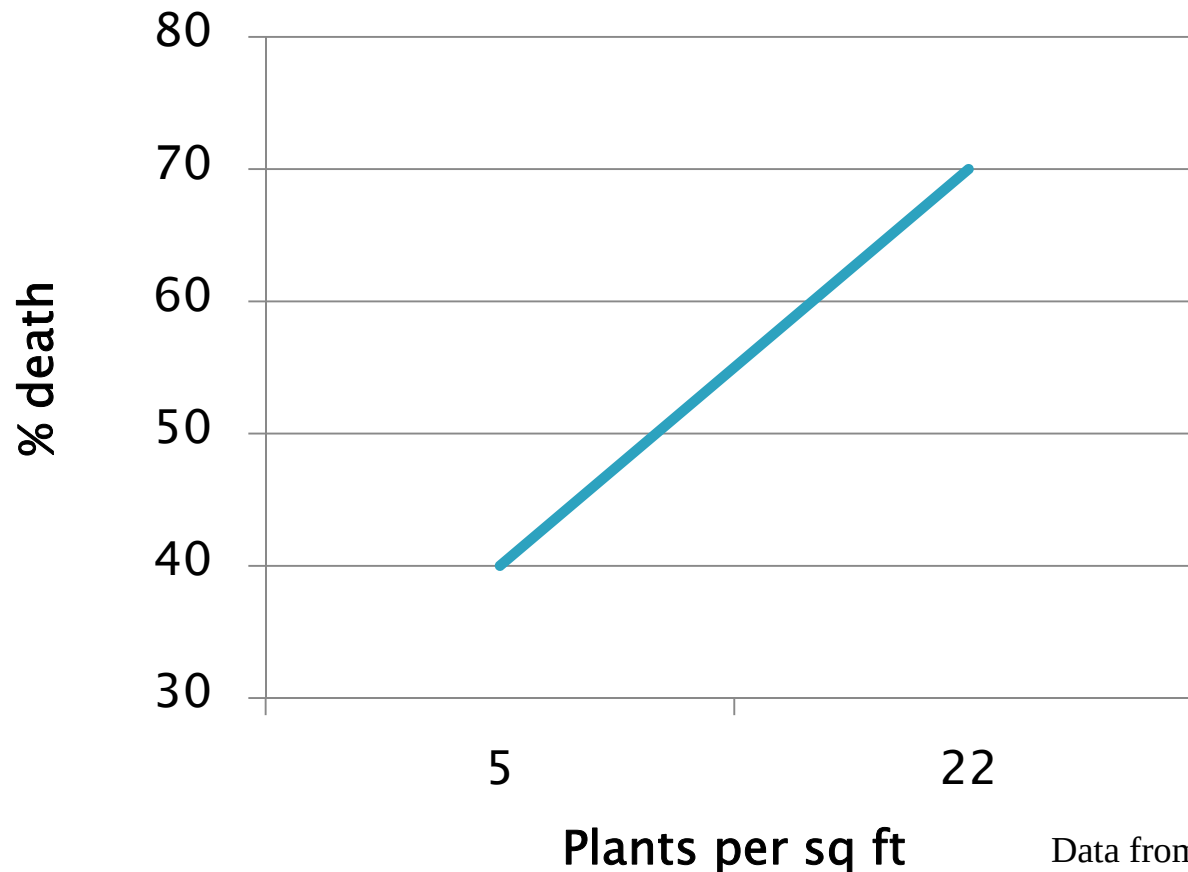
# Effect of seeding rate on alfalfa stand

## 3 to 4 years after establishment – South Dakota



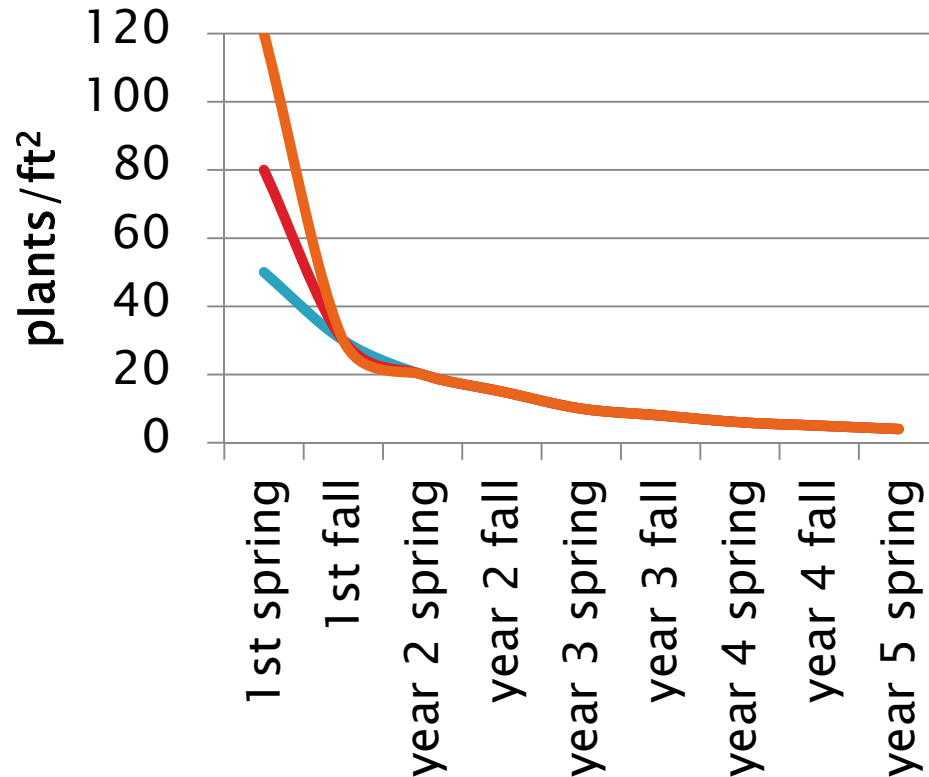
Data from Kephart et al., Agron. J.  
84:827-831 (1992)

# Alfalfa plant mortality during first year at various seeding rates - Pennsylvania



Data from Hall et al., Agron. J.  
96:717-722 (2004).

# Alfalfa Stand Trends - principles



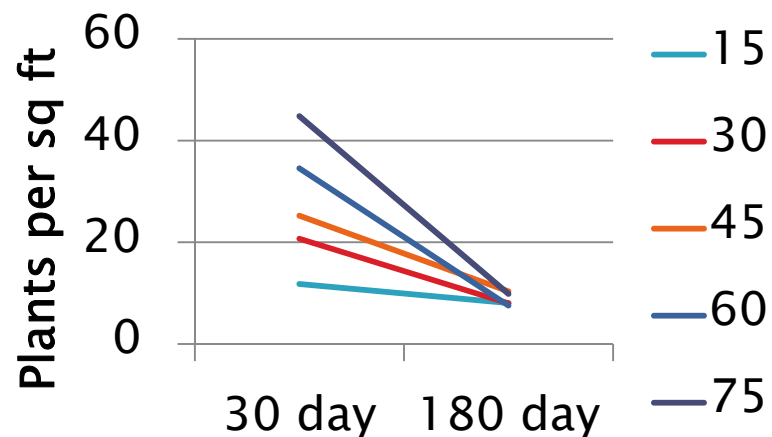
Plants per square foot over time

Principle:

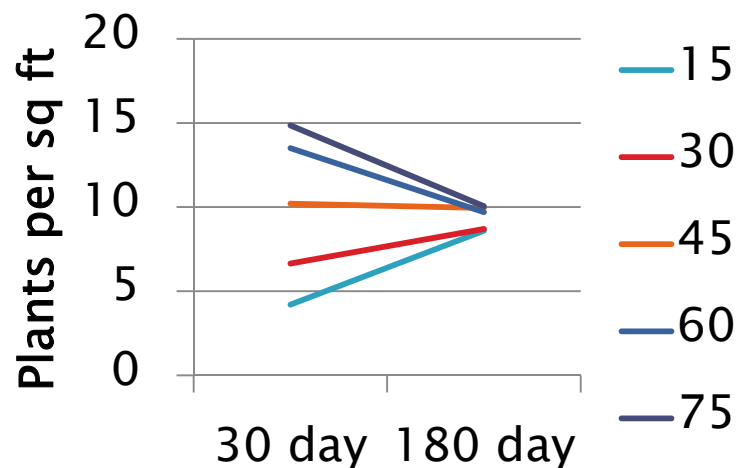
- ✓ At higher seeding rates more plants emerge
- ✓ More seedlings die in seeding year.
- ✓ Same stand density at end of seeding year

# Effect of grass seeding rate on final stand

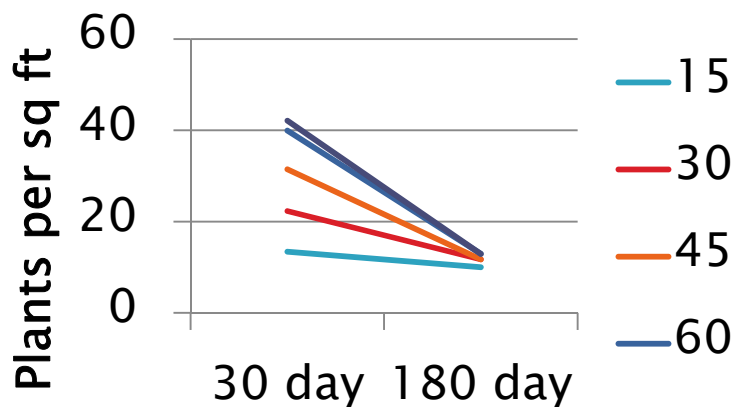
## Meadow Fescue



## Orchardgrass

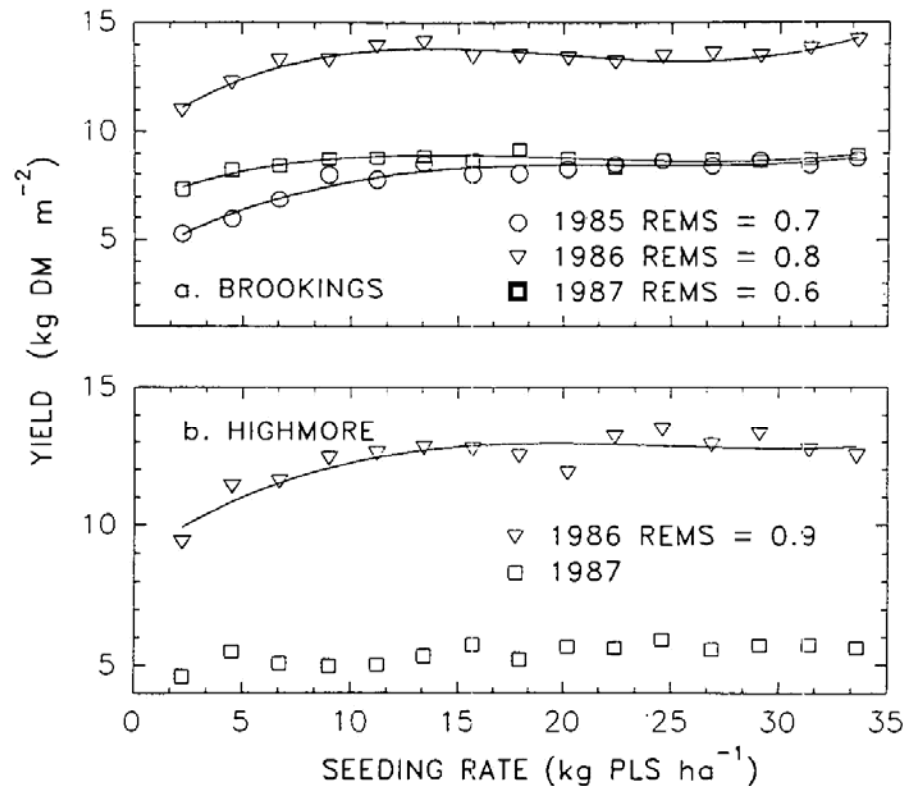


## Tall Fescue





# Effect of seeding rate on seeding year yield



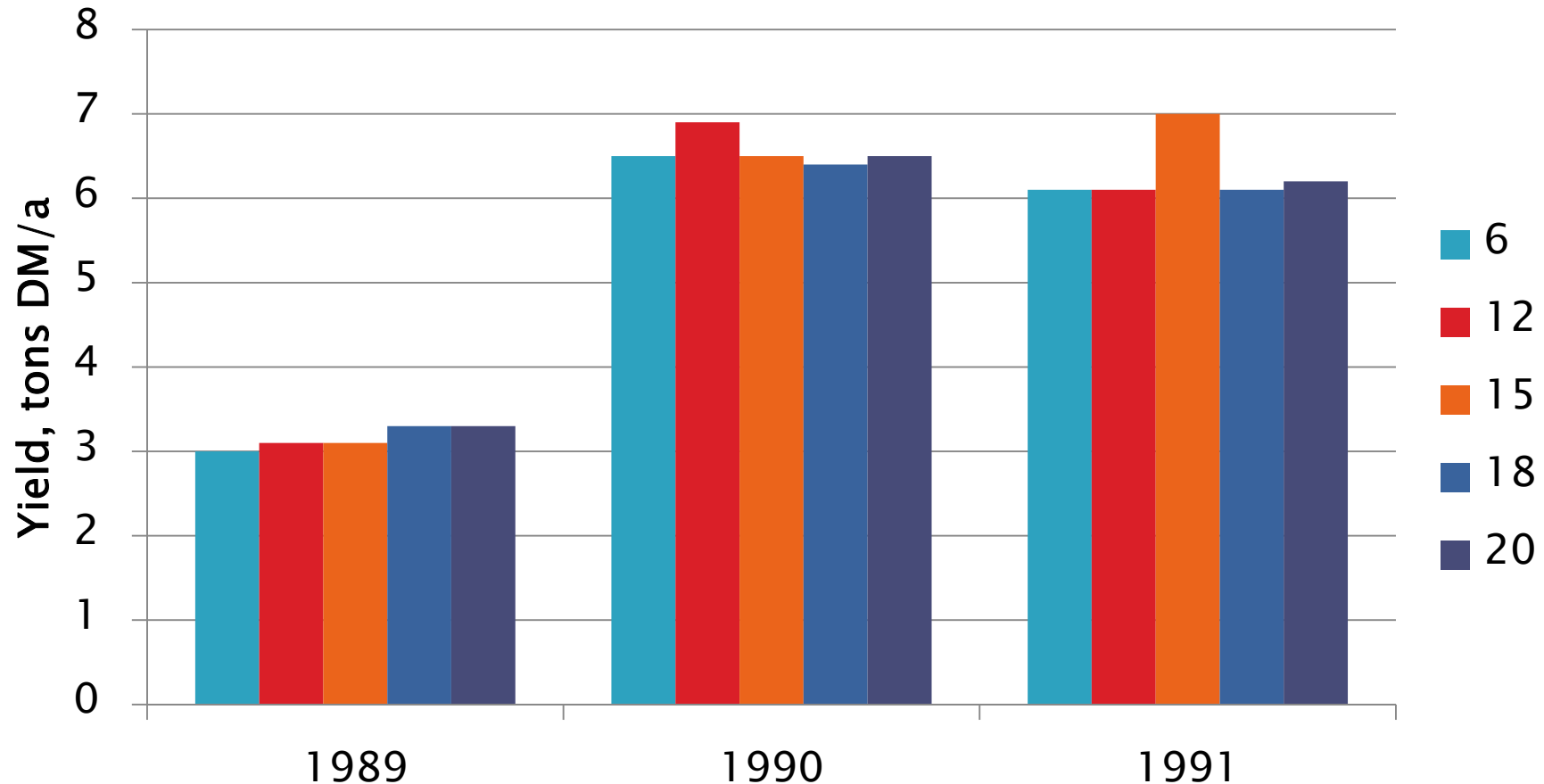
**Fig. 1. Responses of alfalfa dry matter (DM) yield for the total growing season to seeding rate (kg pure live seed (PLS))**

Data from Kephart et al., Agron. J. 84:827-831 (1992)

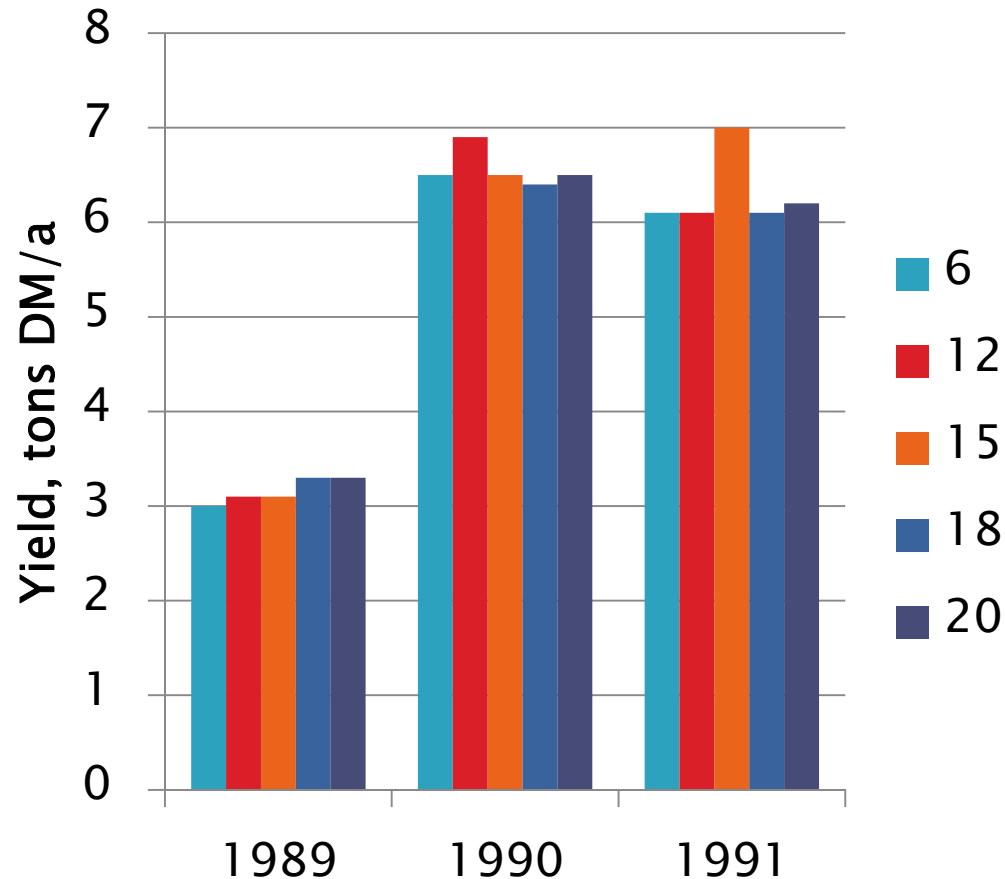


# Alfalfa yield at several seeding rates

Appleton, alfalfa seeded 1989



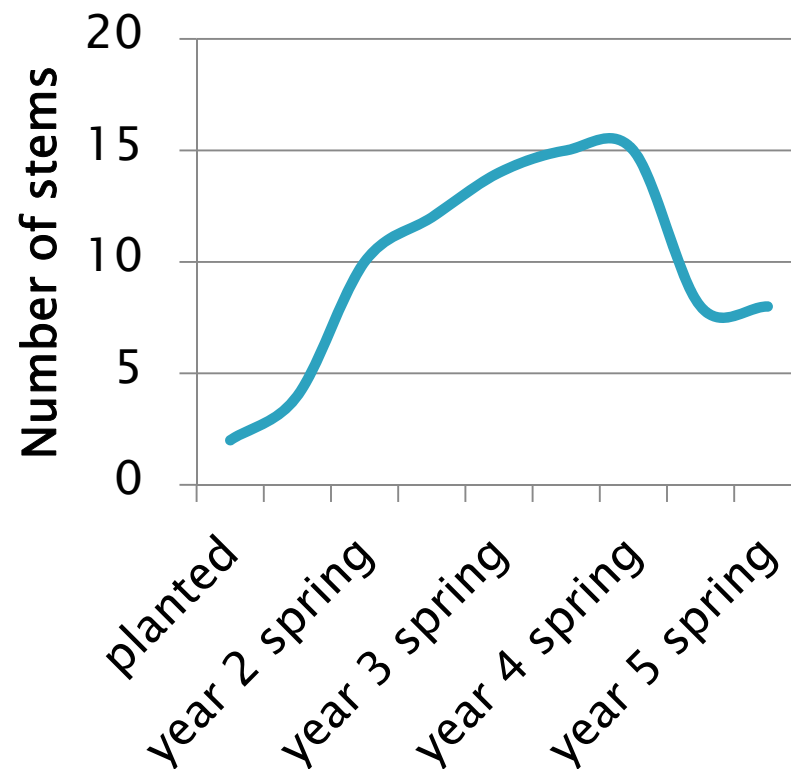
# Alfalfa Stand Trends - principles



Principle:

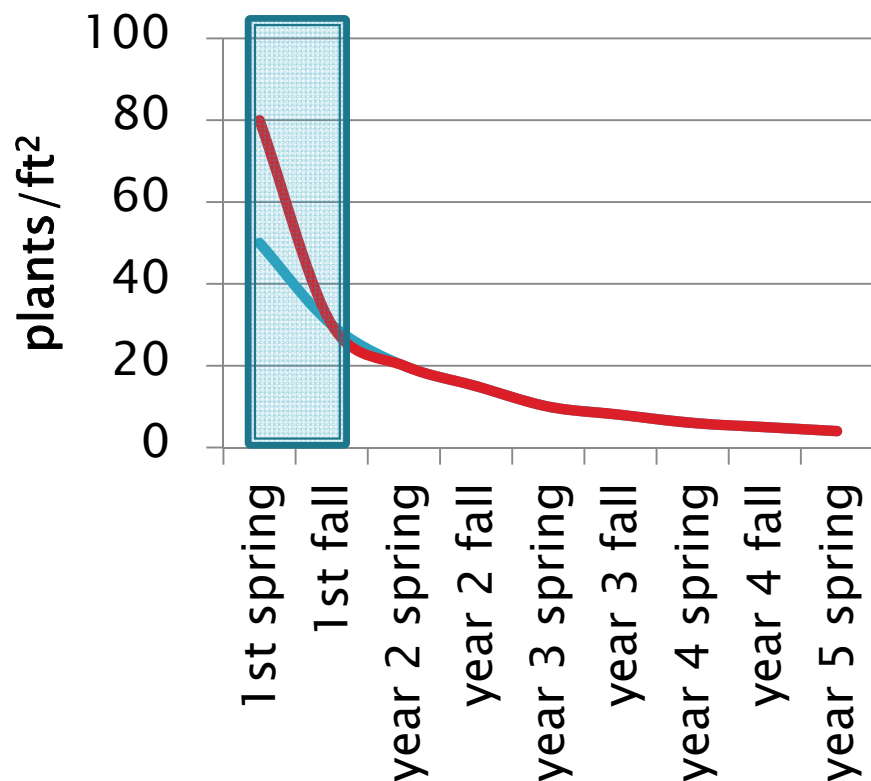
- ✓ At higher seeding rates more plants emerge
- ✓ Same stand density at end of seeding year
- ✓ Same stand and yield in production years

# Alfalfa Stand Trends - principles

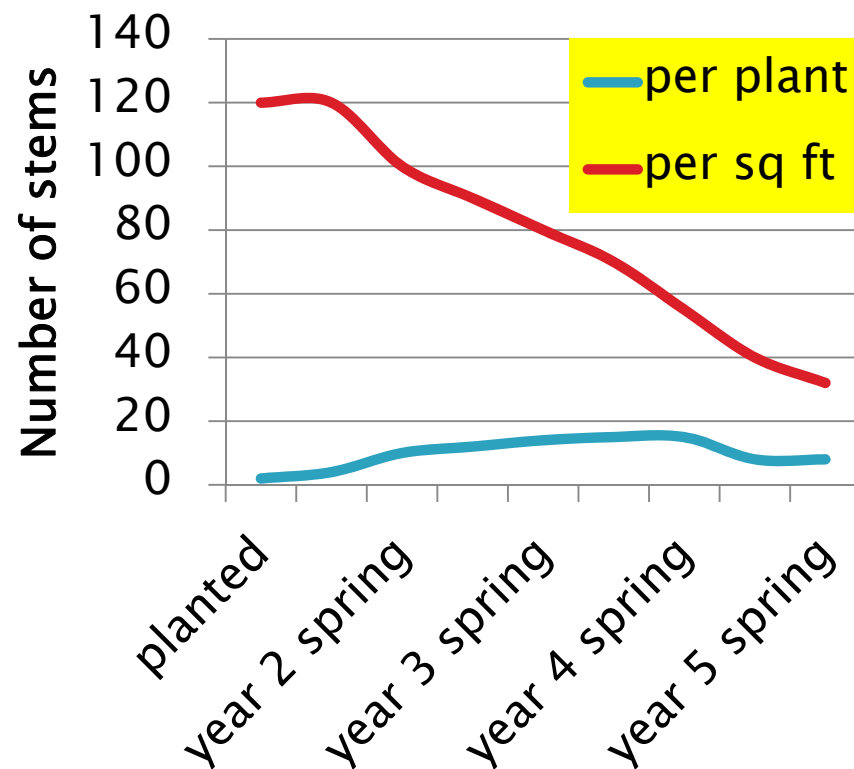


Stems per plant

# Alfalfa Stand Trends



Plants per square foot over time



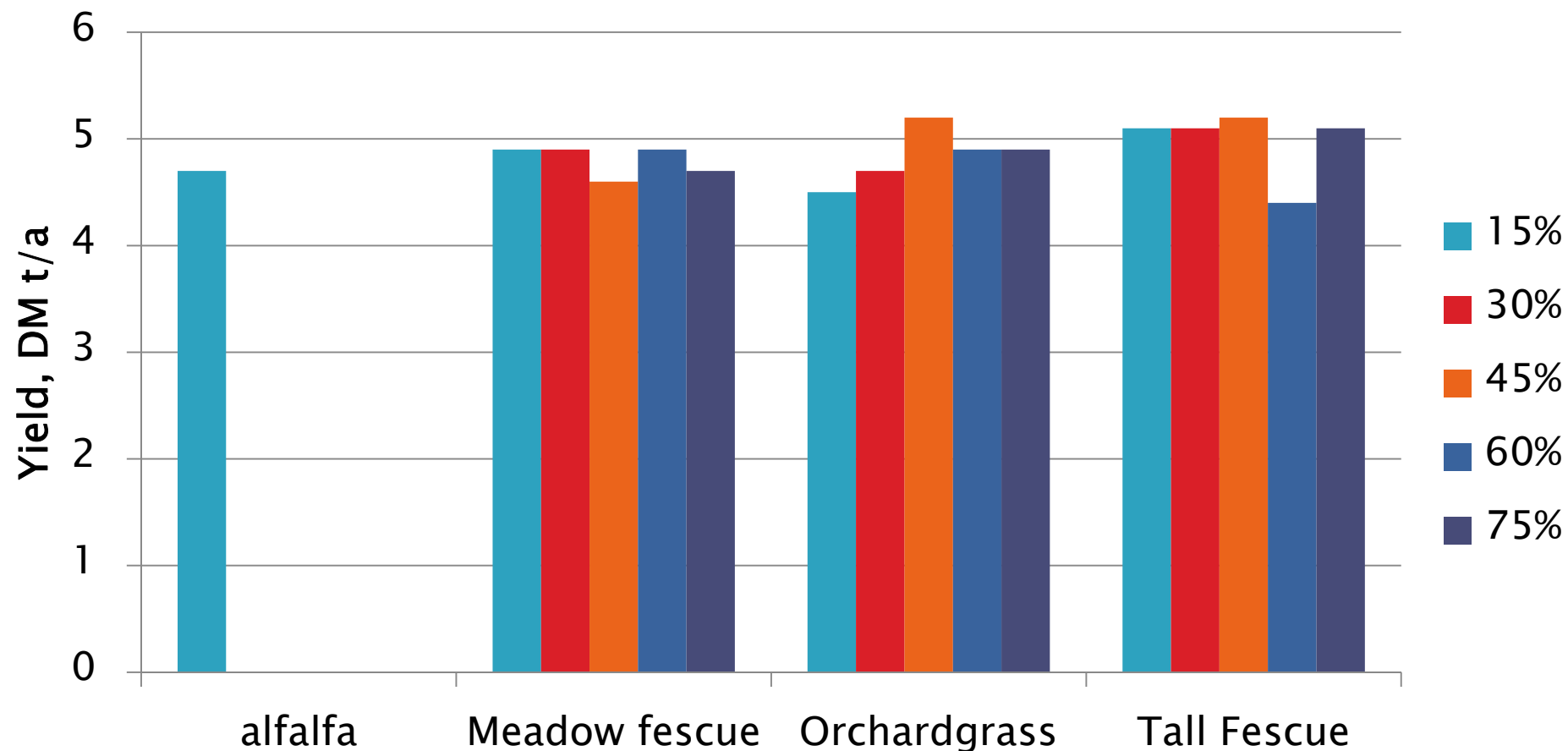
Stems per plant and ft²

# Alfalfa Stand Trends

- ▶ Does higher seeding rate increase seeding year yield?
- ▶ Is it economical?

| Seeding rate | Additional seed cost |        | Additional yield needed to cover cost (\$200/t) |      |
|--------------|----------------------|--------|-------------------------------------------------|------|
| lb/a         | \$5/lb               | \$7/lb | -----t/a-----                                   |      |
| 12           | ---                  | ---    |                                                 |      |
| 18           | \$30                 | \$42   | 0.15                                            | 0.21 |
| 24           | \$60                 | \$84   | 0.30                                            | 0.42 |

# Seeding Year Yield of 5 Seeding Rates of Grass Mixed with Alfalfa (average of 5 site/years)



# Alfalfa seeding rate and first cut yield, 2014

| First cutting yield |                         |               |  |
|---------------------|-------------------------|---------------|--|
| Seeding rate        | -----Yield, DM t/a----- |               |  |
| Lb/a                | Connell, WA             | Arlington, WI |  |
| 8                   | 2.1                     | 2.2           |  |
| 13                  | 2.3                     | 2.5           |  |
| 18                  | 2.5                     | 2.6           |  |
| 23                  | 2.4                     | 2.5           |  |
|                     |                         |               |  |

55VR06 planted  
Data from Pioneer Hybrid Intl,



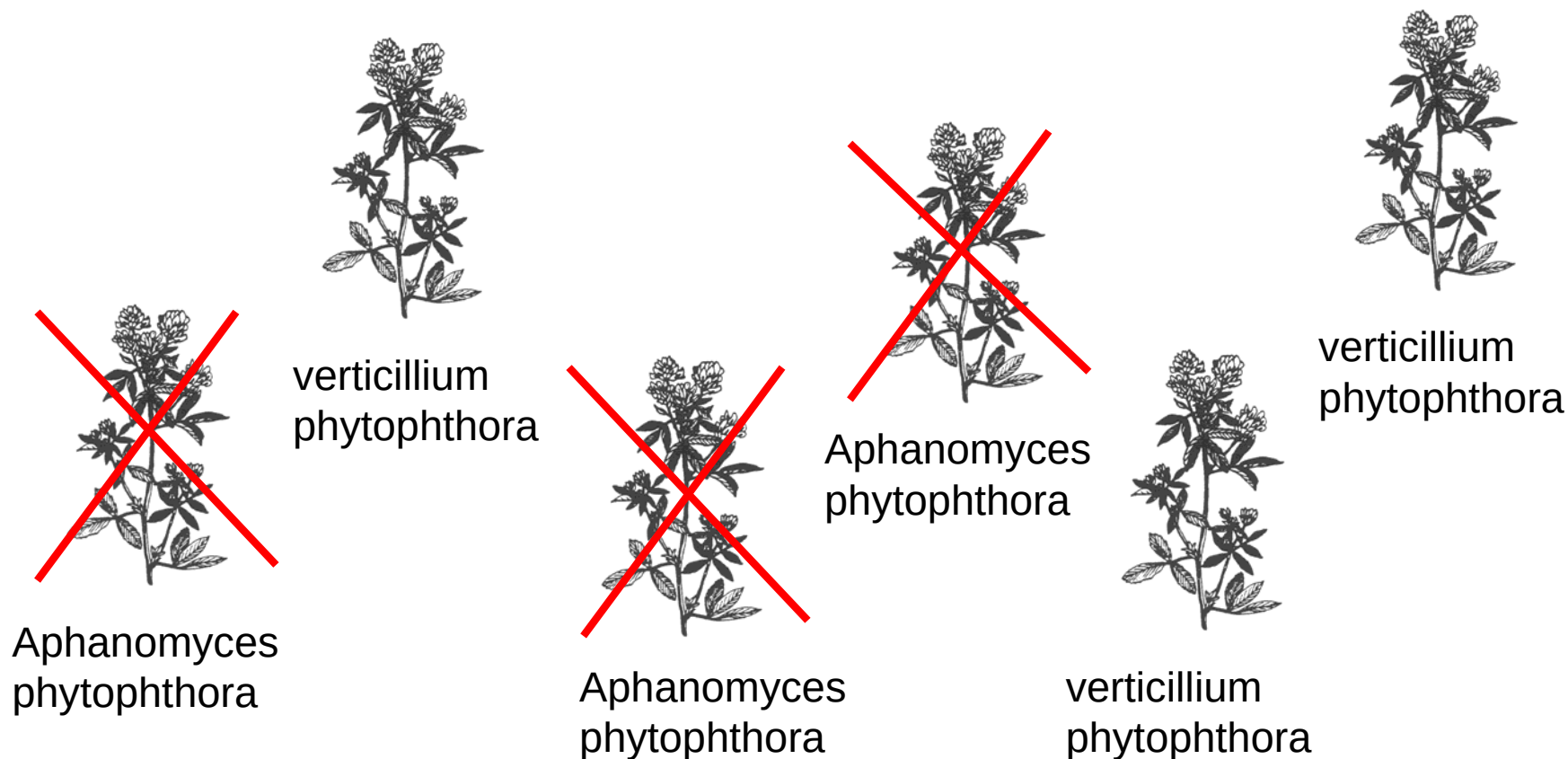
# Alfalfa seeding rate and first cut yield, 2014

| First cutting yield                                |                         |               |            |
|----------------------------------------------------|-------------------------|---------------|------------|
| Seeding rate                                       | -----Yield, DM t/a----- |               | \$ return* |
| Lb/a                                               | Connell, WA             | Arlington, WI |            |
| 8                                                  | 2.1                     | 2.2           | --         |
| 13                                                 | 2.3                     | 2.5           | \$15       |
| 18                                                 | 2.5                     | 2.6           | -\$5       |
| 23                                                 | 2.4                     | 2.5           | -\$55      |
| * = value of additional hay - additional seed cost |                         |               |            |

55VR06 planted  
Data from Pioneer Hybrid Intl,

# Seeding rate and stand health

Alfalfa is synthetic population – each plant genetically different

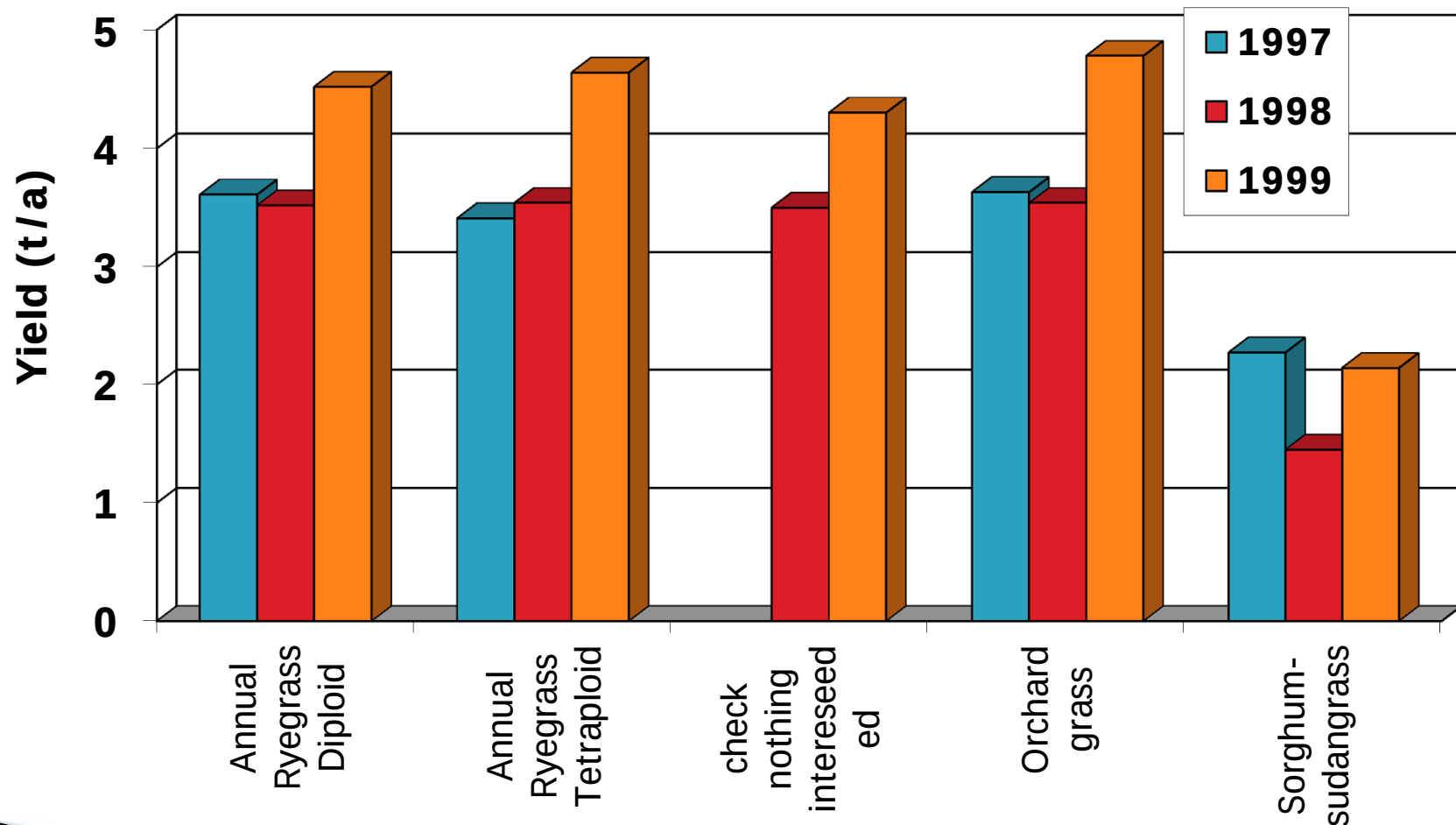


# Overseeding to Thicken Stand

## Survival of Over Seeded Alfalfa



# Interseeding into thin alfalfa stands – Seldom improves yield



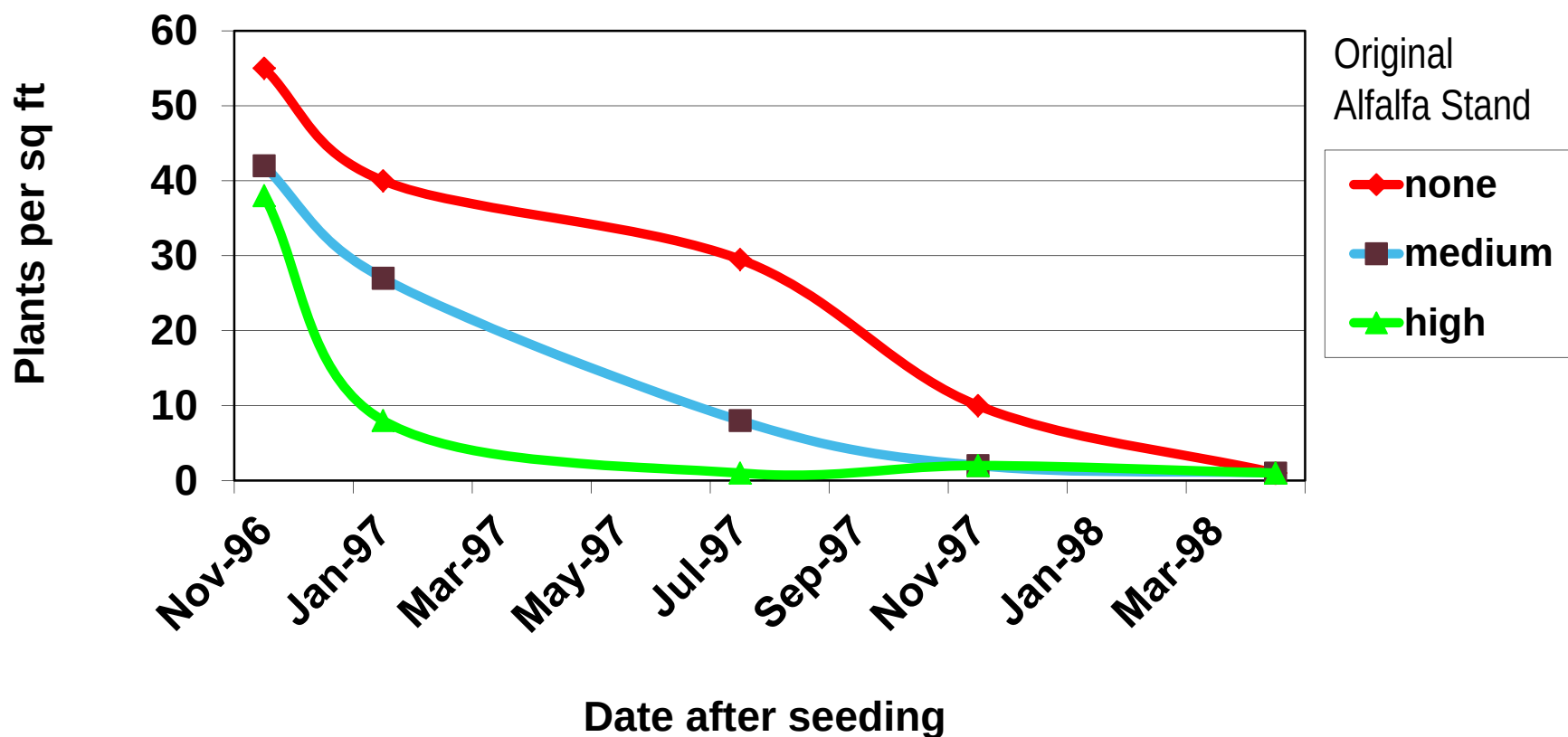
# Interseeding into thin alfalfa stands - Seldom improves yield

- ▶ Interseeding grasses into alfalfa
  - Ryegrass responds quickly but does not grow well in summer heat or drought
  - Orchardgrass and tall fescue take 60 to 90 days to begin producing yield



# Overseeding Alfalfa to Thicken Stand

## Survival of Overseeded Alfalfa plants



Source: Rachael Long, Univ of CA

# Crop Rotation

- ▶ When turning over alfalfa need to wait 1 to 2 years before reseeding due to autotoxicity
- ▶ Alfalfa will provide adequate nitrogen for corn for 1 year and barley or canola for 1 to 2 years
- ▶ Barley, canola, corn will yield more following alfalfa than barley following barley or canola following canola



# Prior Rotation





**Alfalfa 2011  
Corn 2012**

**Prior Rotation**

**Continuous  
Corn**





# Calibrate Seeder

- alfalfa seeding rate varies with seed lot

Two seeders, no change in setting, 6 different varieties

| Variety | Brillion<br>seeder      | John Deere<br>Drill |
|---------|-------------------------|---------------------|
|         | <u>lb seed per acre</u> |                     |
| 1       | 18.3                    | 21.4                |
| 2       | 17.0                    | 20.3                |
| 3       | 15.0                    | 16.3                |
| 4       | 13.8                    | 16.3                |
| 5       | 20.8                    | 16.5                |
| 6       | 20.3                    | 16.8                |

# Summary

- ▶ Alfalfa seeding rates above 12 lb/a
  - Do not increase stand or yield in seeding year
  - Do not increase yield in production years
- ▶ Interseeding crop into thin alfalfa stands does not increase yield
- ▶ Alfalfa autotoxicity can reduce new alfalfa stand growth for up to 2 years on medium to heavy soils