

Alfalfa Management

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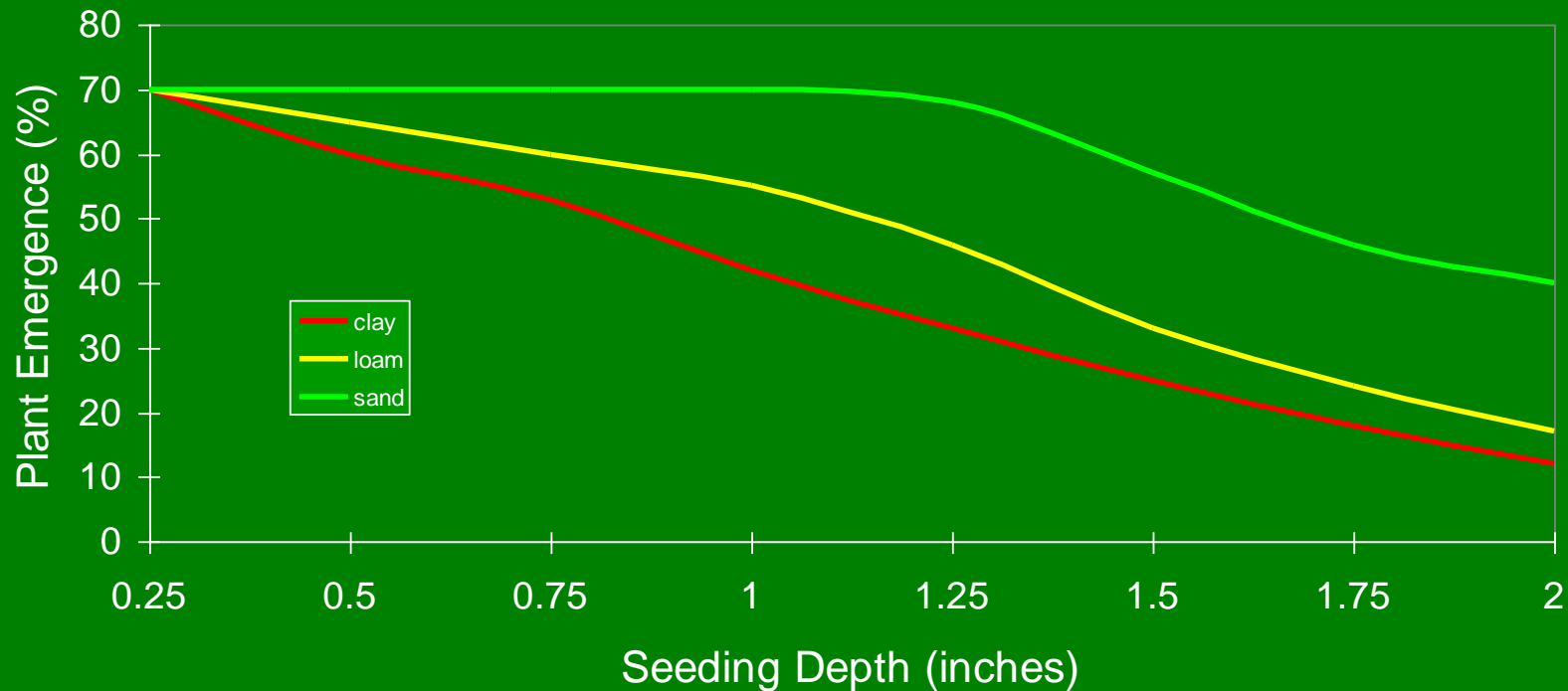
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Causes of Seeding Failure

- Low soil pH
- Loose soil
- Seeding too deep



Effect of Seeding Depth on Alfalfa Emergence





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Increased Winterhardiness

- Less winterkill
- Less winter injury – more yield



Winterhardness Test of Alfalfa

Procedure

- Space plant alfalfa (1 ft apart) in rows 1 ft apart
- Clip frequently during seeding year
- Cut on Sept 20 in seeding year
- Rate individual plants in spring for injury and kill
- Report results relative to check varieties



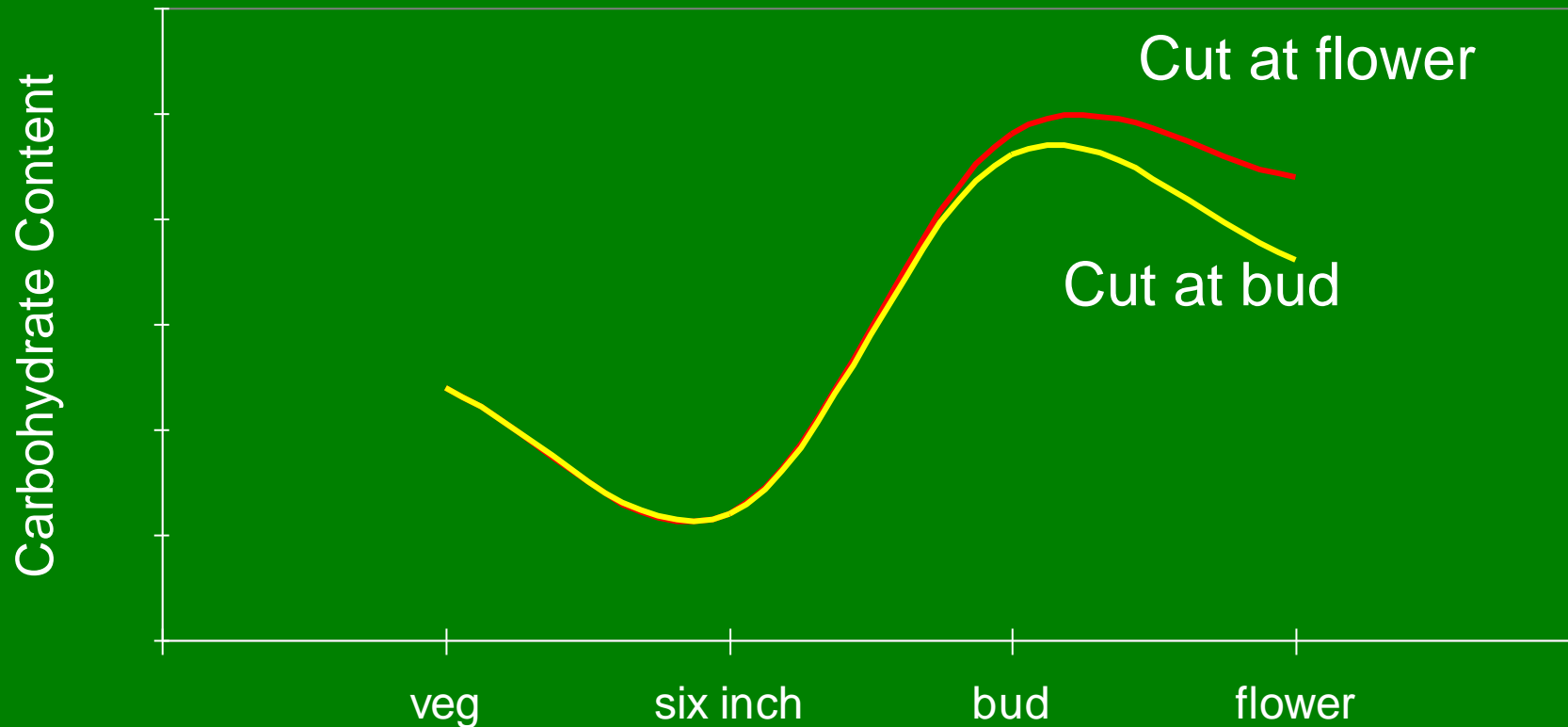


Recommendations

- Very Winterhardy, Winterhardy, Moderately Winterhardy alfalfa varieties recommended for Wisconsin
- Plant more winterhardy type if:
 - Uneven greenup in spring frequently occurs
 - Cutting schedule always less than 35 days
 - Harvest late fall cutting



Pattern of Root Carbohydrates



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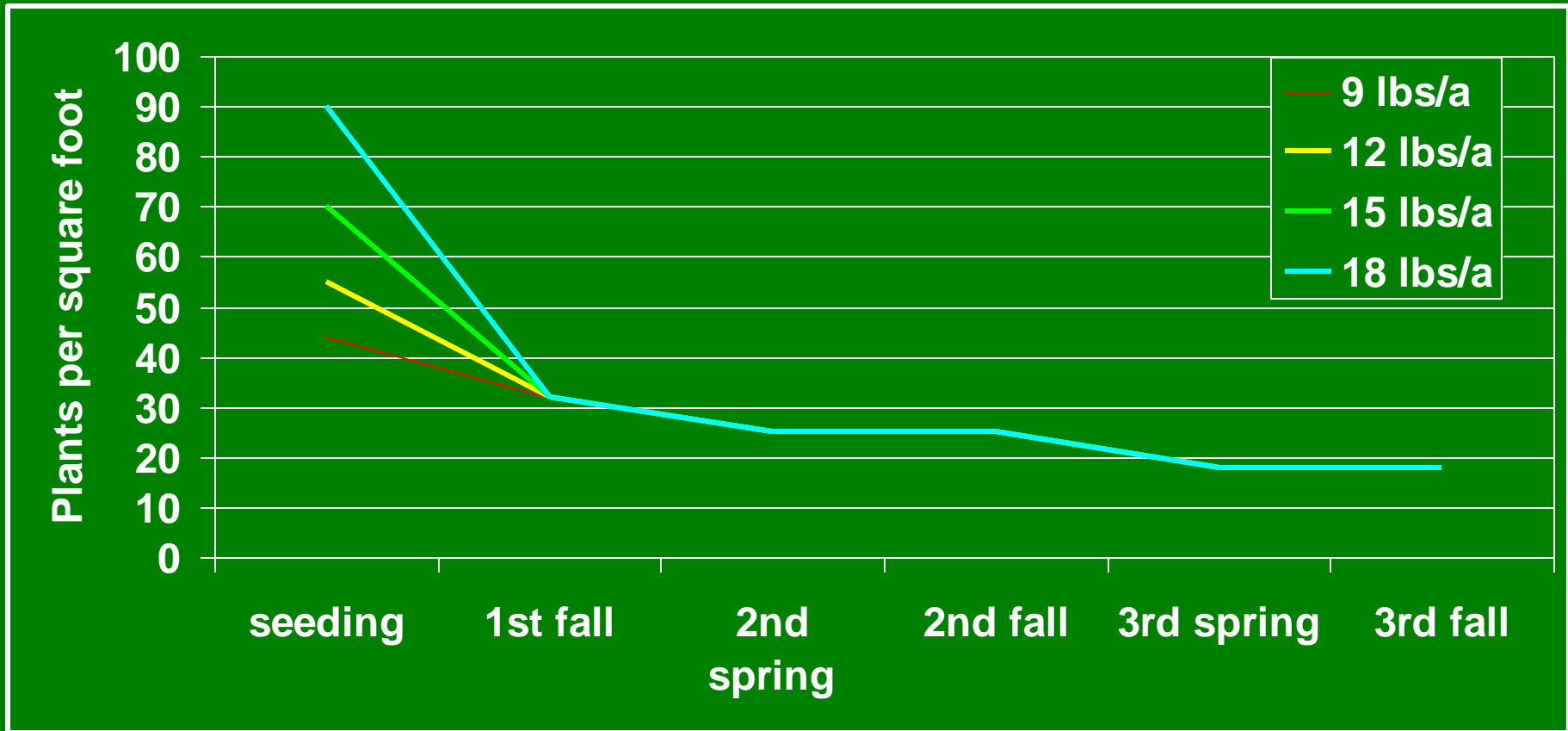
Calibrate Seeder

- seeding rate varies with seed lot

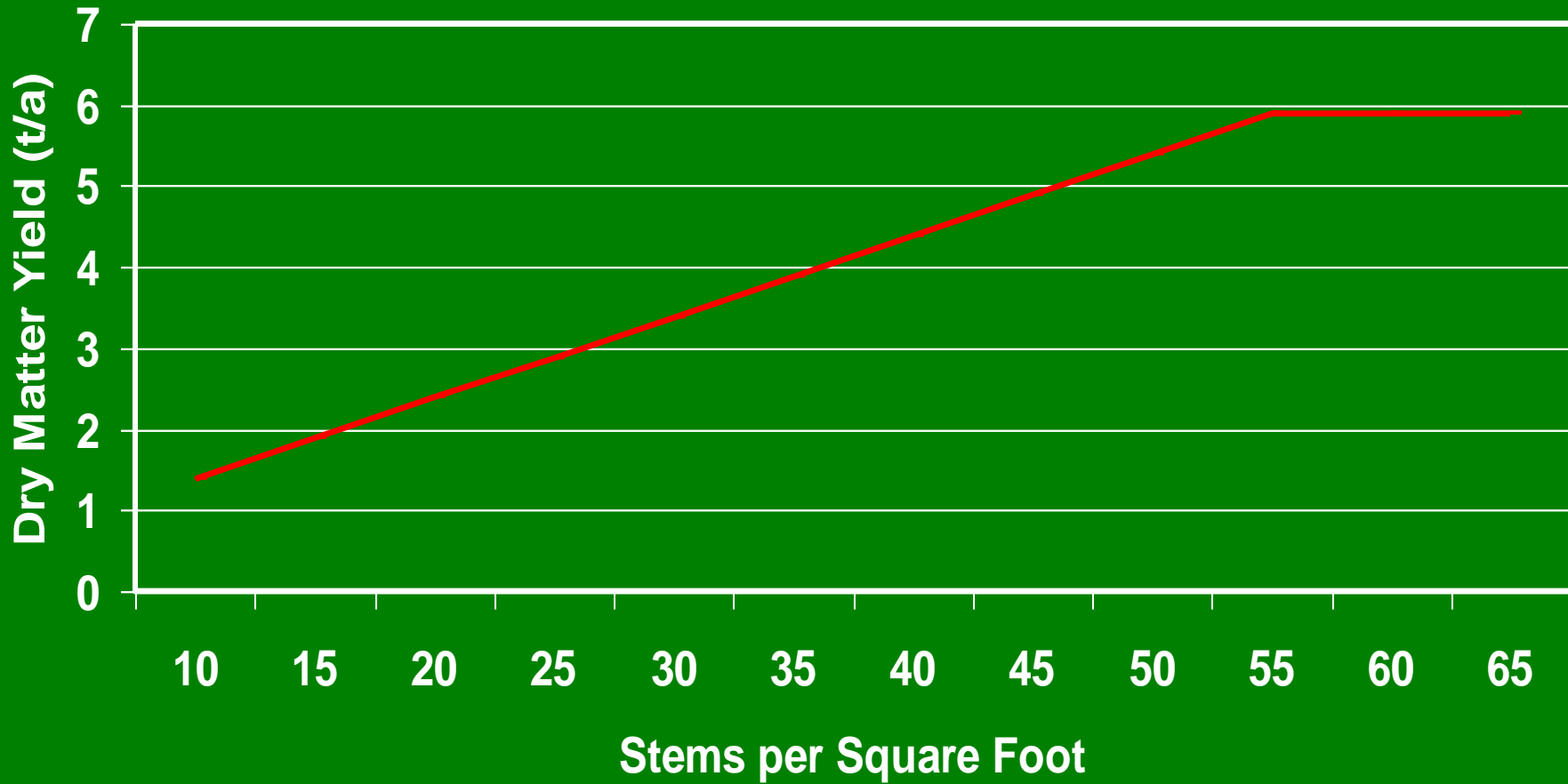
Variety	John Deere	
	Brillion Seeder	Drill
1	18.3	21.4
2	17.0	20.3
3	15.0	16.3
4	13.8	16.3
5	20.8	16.5
6	20.3	16.8



Effect of seeding rate on alfalfa stand

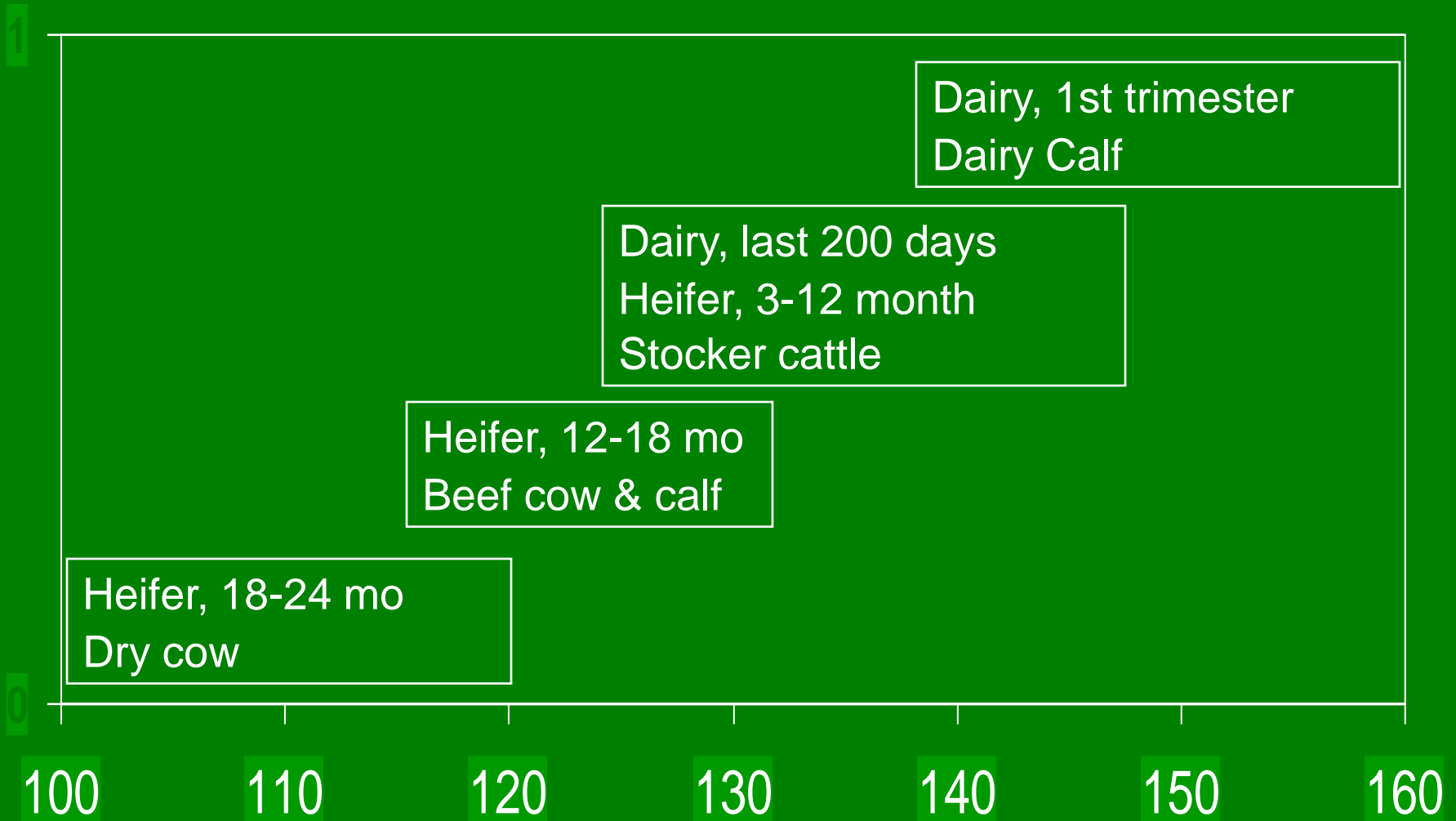


Alfalfa Stem Count and Yield Potential



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Forage quality needs of cattle



1. What is your stand age?		
> 3 years		4
2–3 years		2
< 1 year		1
2. Describe your alfalfa variety:		
a. What is the winterhardiness?		
Higher than recommended for region		3
Recommended for region		2
Lower than recommended for region		1
	a. total	___
b. What is the disease resistance?		
Moderate resistance to only bacterial wilt		4
Moderate or higher resistance to bacterial wilt plus Fusarium wilt, Phytophthora root rot, or Verticillium wilt		3
Moderate or higher resistance to all above-mentioned diseases		1
	b. total	___
<i>Alfalfa variety total score (multiply a and b)</i>		
3. What is your soil pH?		
≤ 6.0		4
6.1–6.5		2
≥ 6.6		0
4. What is your soil exchangeable K level?		
Low (≤ 80 ppm)		4
Medium (81–120 ppm)		3
Optimum (121–160 ppm)		1
High (≥ 161 ppm)		0
5. What is your soil drainage?		
Poor (somewhat poorly drained)		3
Medium (well to moderately well drained)		2
Excellent (sandy soils)		1
6. What is your soil moisture during fall/winter?		
Medium to dry		0
Wet		5
7. Describe your harvest frequency:		
Cut interval	Last cutting¹	
< 30 days	Sept. 1–Oct. 15	5
	After Oct. 15	4
	Before Sept. 1	3
30–35 days	Sept. 1–Oct. 15	4
	After Oct. 15	2
	Before Sept. 1	0
> 35 days	Sept. 1–Oct. 15	2
	After Oct. 15	0
	Before Sept. 1	0
8. For a mid-September or late October cut, do you leave more than 6 inches of stubble?		
No		1
Yes		0
Determine your total score (sum of points from questions 1–8)		total



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1. What is your stand age?

> 3 years	4	
2 to 3 years	2	
≤ 1 year	1	0



2. Describe your alfalfa variety:

A. What is the winterhardiness?

Moderately winterhardy (ws score 4)	3	
Winterhardy (ws score 3)	2	
Very Winterhardy (ws score 2)	1	0

B. What is the disease resistance?

Moderate resistance to only bacterial wilt	4	
Moderate resistance to Bacterial wilt plus either Anthracnose, Fusarium wilt, phytophthora root rot, or Verticillium wilt	3	
Moderate resistance to all above mentioned diseases	1	0
<i>Alfalfa variety total score (multiply two)</i>		0



3. What is your soil pH?

≤ 6.0

4

6.1 TO 6.5

2

≥ 6.6

0

0



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4. What is your soil exchangeable K Level?		
Low (≤ 80 ppm)	4	
Medium (80 to 120 ppm)	3	
Optimum (120 to 160 ppm)	1	
High (≥ 161 ppm)	0	0



5. What is your soil drainage?		
Poor (somewhat poorly drained)	3	
Medium (well to moderately drained)	2	
Excellent (sandy soils)	1	0



6. What is you soil moisture during fall/winter?		
Wet	5	
Medium to dry	0	0



7. Describe your harvest frequency:

Cut interval	Last Harvest		
< 30 days	Sept. 1 to Oct. 15	5	
	After Oct. 15	4	
	Before Sept. 1	3	
30 to 35 days	Sept. 1 to Oct. 15	4	
	After Oct. 15	2	
	Before Sept. 1	0	
> 30 days	Sept. 1 to Oct. 15	2	
	After Oct. 15	0	
	Before Sept. 1	0	0



8. For a mid to late October cut, do you leave more than 6 inches of stubble?		
Yes	1	
No	0	0

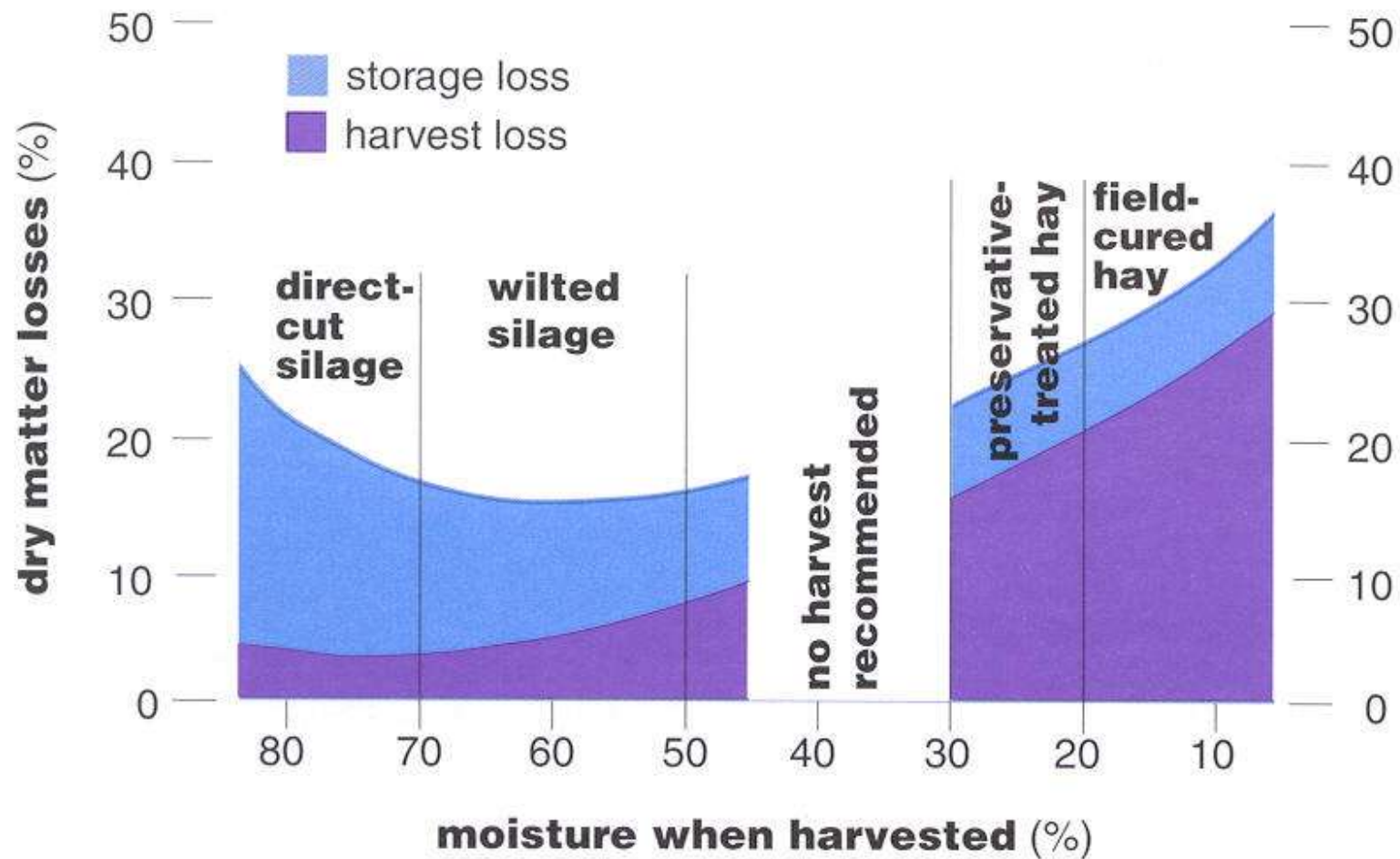


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Determine your total score (sum of points from questions 1-8)		total



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Source: Høglund, Michigan State University, 1964



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Alfalfa Autotoxicity

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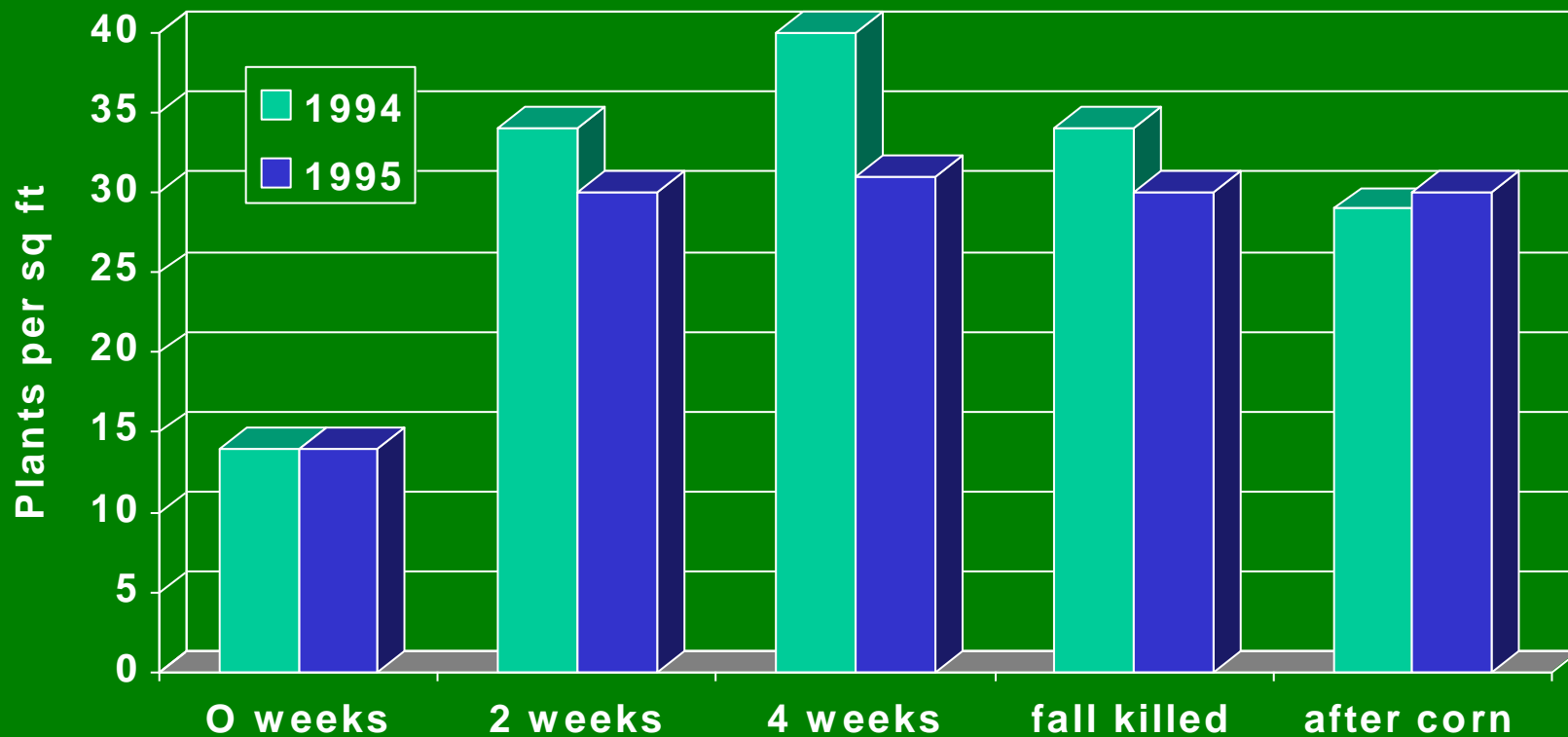
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Alfalfa Autotoxicity

- Stand Reduction in 4 experiments
 - Average 18% Range 7.9 to 32%
- Yield Reduction in 12 experiments
 - Average 22% Range 6 to 52%



Effect of waiting period on alfalfa autotoxicity in no-till

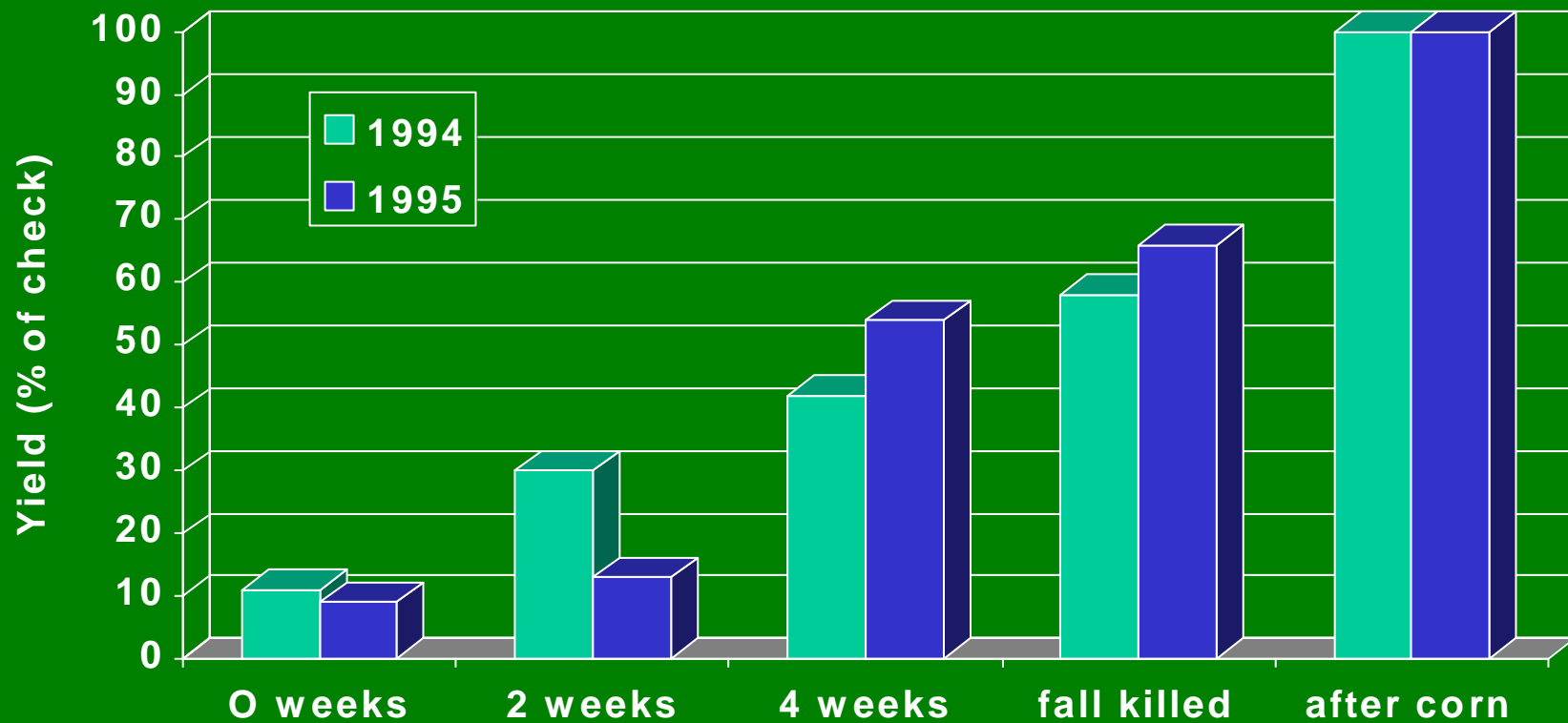


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Cosgrove et al., 1996

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Effect of waiting period on alfalfa autotoxicity in no-till

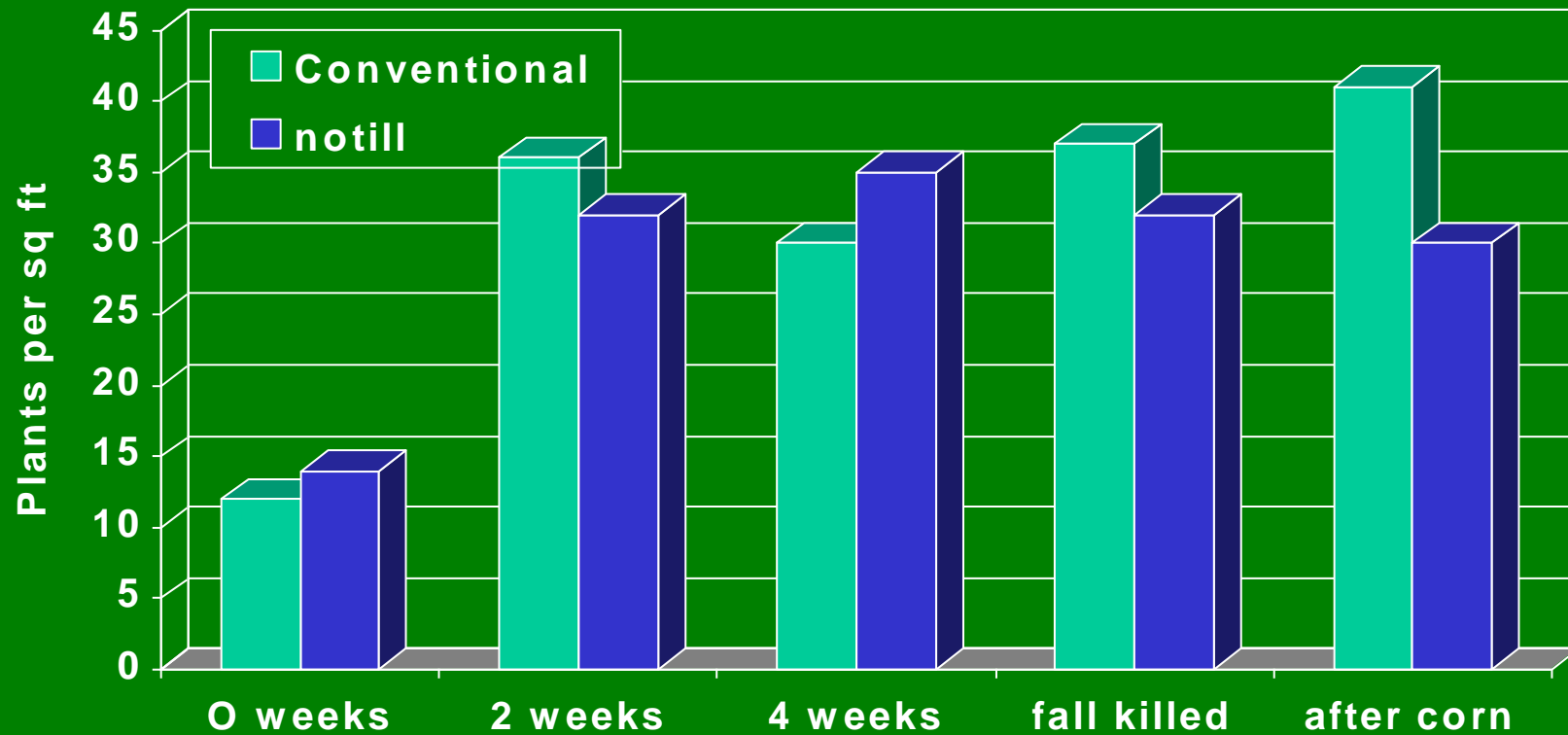


Cosgrove et al., 1996



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Alfalfa autotoxicity – conventional vs notill

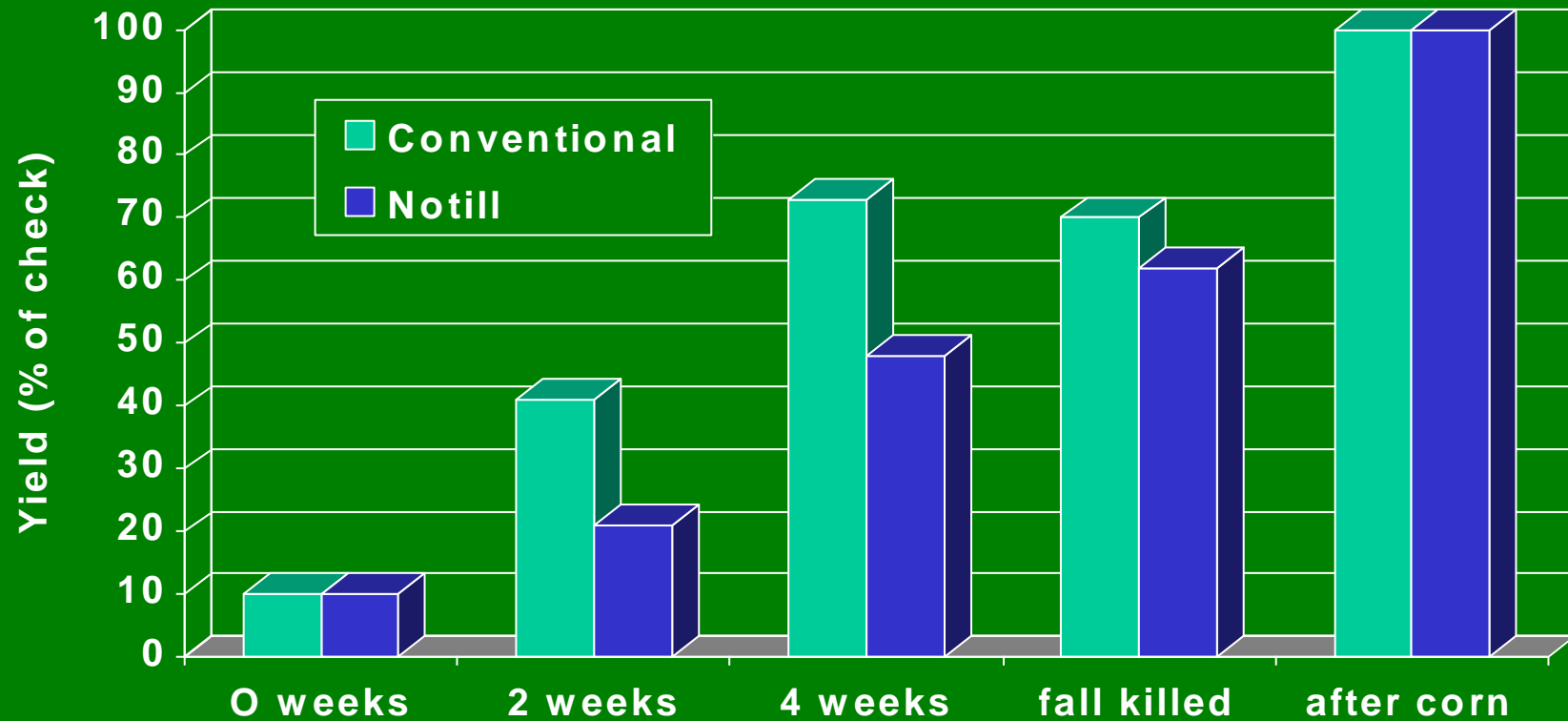


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Cosgrove et al., 1996

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Alfalfa autotoxicity – conventional vs no-till

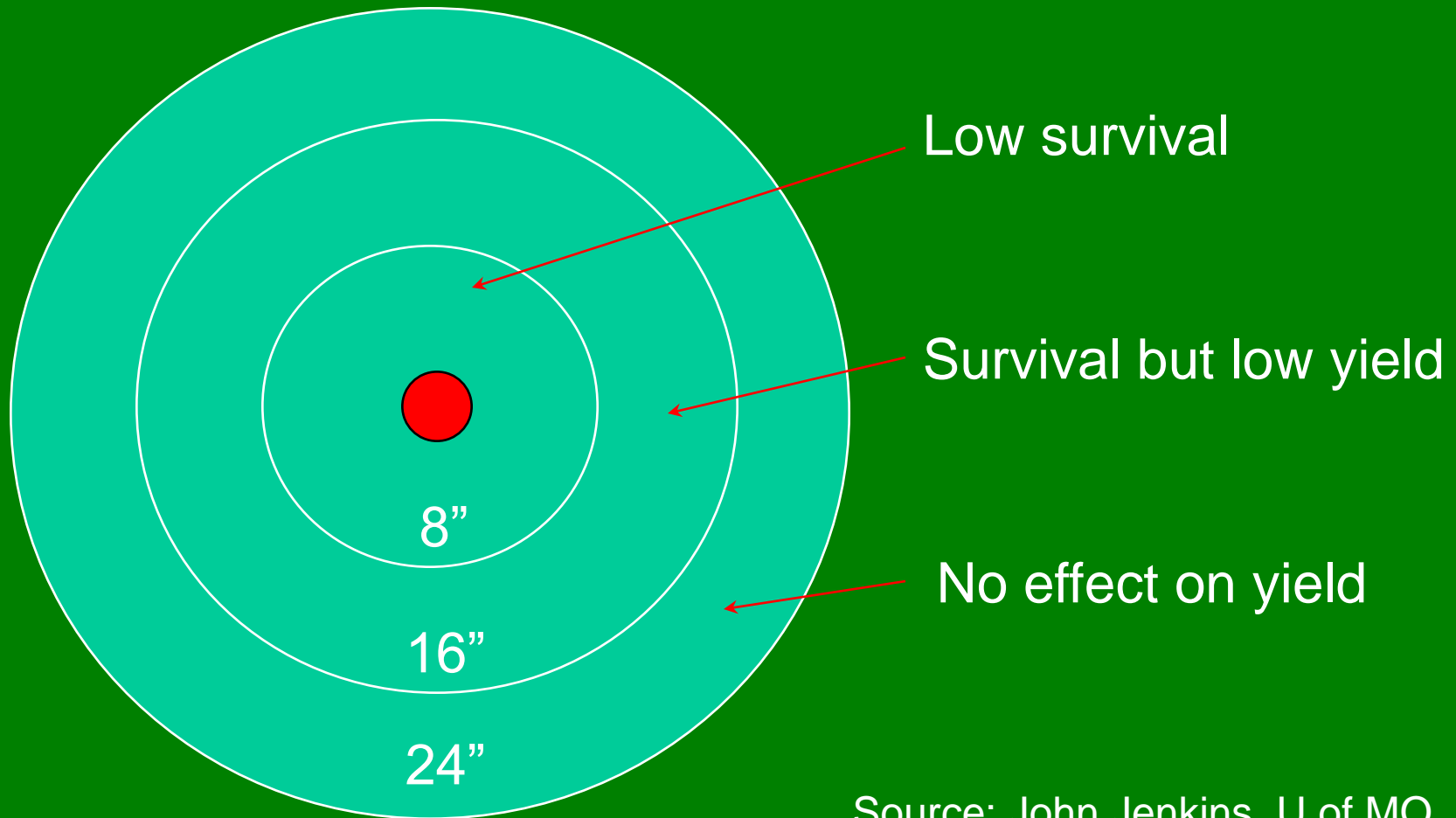


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Alfalfa Zone of Influence - *distance from old plant*



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Source: John Jenkins, U of MO

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Autotoxicity Summary

- Reduces germination if severe
- Reduces yield for life of stand
- Effect most severe on light soils
- Effect most prolonged on heavy soils
- Area of influence around living plant is 16" radius
- Irrigation/rains can wash autotoxic factor from soil



Autotoxicity Risk

1. Amount of previous alfalfa topgrowth incorporated or left on soil surface		
Fall cut or grazed	1	
0 to 1 ton topgrowth	3	
more than 1 ton topgrowth	5	1
2. Disease resistance of the variety to be seeded		
High disease resistance	1	
Moderate disease resistance	2	
Low disease resistance	3	1
3. Irrigation or rainfall potential prior to reseeding		
High (greater than 2 inches)	1	
Medium (1 to 2 inches)	2	
Low (less than 1 inch)	3	2
4. Soil type		
Sandy	1	
Loamy	2	
Clayey	3	2
5. Tillage prior to reseeding		
Mold board plow	1	
Chisel plow	2	
No-till	3	1
6. Sum of 1 to 5		7
7. Age of previous alfalfa stand		
One year or less	0	
One to two years	0.5	
More than two years	1	1
8. Re-seeding delay after alfalfa kill/plowdown		
12 months or more	0	
6 months	1	
2 to 4 weeks	2	
Less than two weeks	3	1
Your Total Score (multiply 6*7*8)		7



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Alfalfa Reseeding Risk

If you score	Your Risk is:	Recommendation:
0	Low	Seed
4 to 8	Caution	Caution, potential yield loss
9 to 12	High	Yield loss likely
> 13	Very High	Avoid seeding, likely yield & stand loss



Recommendations

- Wait at least one year before reseeding alfalfa if stand in for two or more years
- Can reseed new seeding failures anytime



Recommendations for Emergencies

- Remove topgrowth before plowing to reduce effect
- Tillage can reduce effect
- Irrigation/rains can wash toxic factor from soil
- Select fields with lightest soils
- Accept some yield loss

