



Cover Crops

Why to use them in Illinois

Mike Plumer
Illinois C-BMP

Your Reasons to Use Cover Crops

- Improved soil tilth
- Increase Organic Matter
- Increase soil biological activity
- Improve soil structure/reduce compaction
- Increase soil moisture holding capacity
- Add nitrogen
- Cycle nutrients
- Control soil erosion and protect water quality

Decide what is important to you



What to Look For in A Cover Crop

- Fast germination and emergence
 - Competitiveness
- Tolerance to adverse climatic & soil conditions
 - Ease of suppression/residue management
 - Fertility/soil quality benefits
 - Low-cost

Today's Cover Crops

managing for future productivity

- Radish accumulating fertility, weed control
- Cereal rye weed control, nematode reduction
- Hairy vetch weed control, nitrogen, tilth
- Annual ryegrass fertility, compaction, root growth, nematode reduction
- Crimson clover nitrogen, soil tilth
- Rapeseed disease and nematode reduction
- Spring oats weed control, increase growth

Blending cover crops

- Can be companion crop to enhance growth
 - Like oats
- Match blend to growth habit
- Some blends competitive/ allelopathic
- Can be difficult to control in spring
 - Due to differences in growth patterns/maturity/species

Nitrogen Uptake

- after a corn crop
 - Pick up left over nitrogen and hold till spring
- After manure application grasses can:
 - 300-700 lbs of N taken up
 - Keeps N in the soil profile
 - Most N available if burn down applied before joint stage

Nitrogen Uptake

- Continuous no-till
- Corn after Corn
- 200#N/a = 215 bu/A
- 3642 #/A. annual ryegrass Jan. 6
- 84 #/a of Nitrogen from ryegrass water leachable




Annual ryegrass can uptake and hold 800#/a nitrogen and release in spring

Cover crops as a Forage

- Great fit after corn silage or wheat
- Manure will stimulate growth
- Graze in fall and spring or cut for haylage
- 1.5 to 4 tons of high quality forage
- Protein content will decrease after joint stage


Soil Quality



18month old corn stalks
No decomposition,
Poor Soil activity



Severe rooting reduction



Tillage reduced OM
Top 8" 3%,
below untilled 5.5+ %

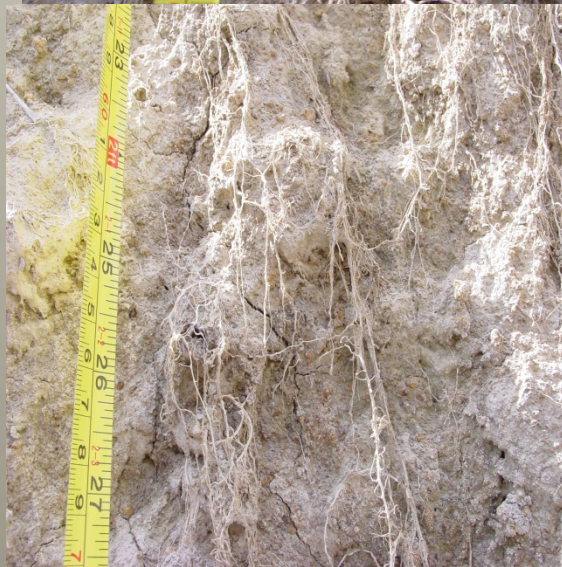
20
To
23”



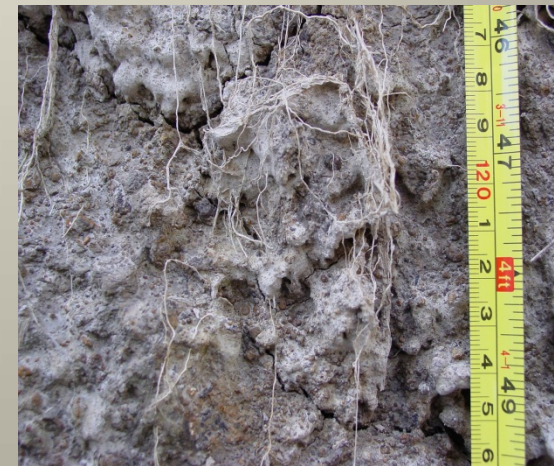
37
to
43”



23
to
28”



46
to
50”



6 years cover crops and no-till effects on corn root development

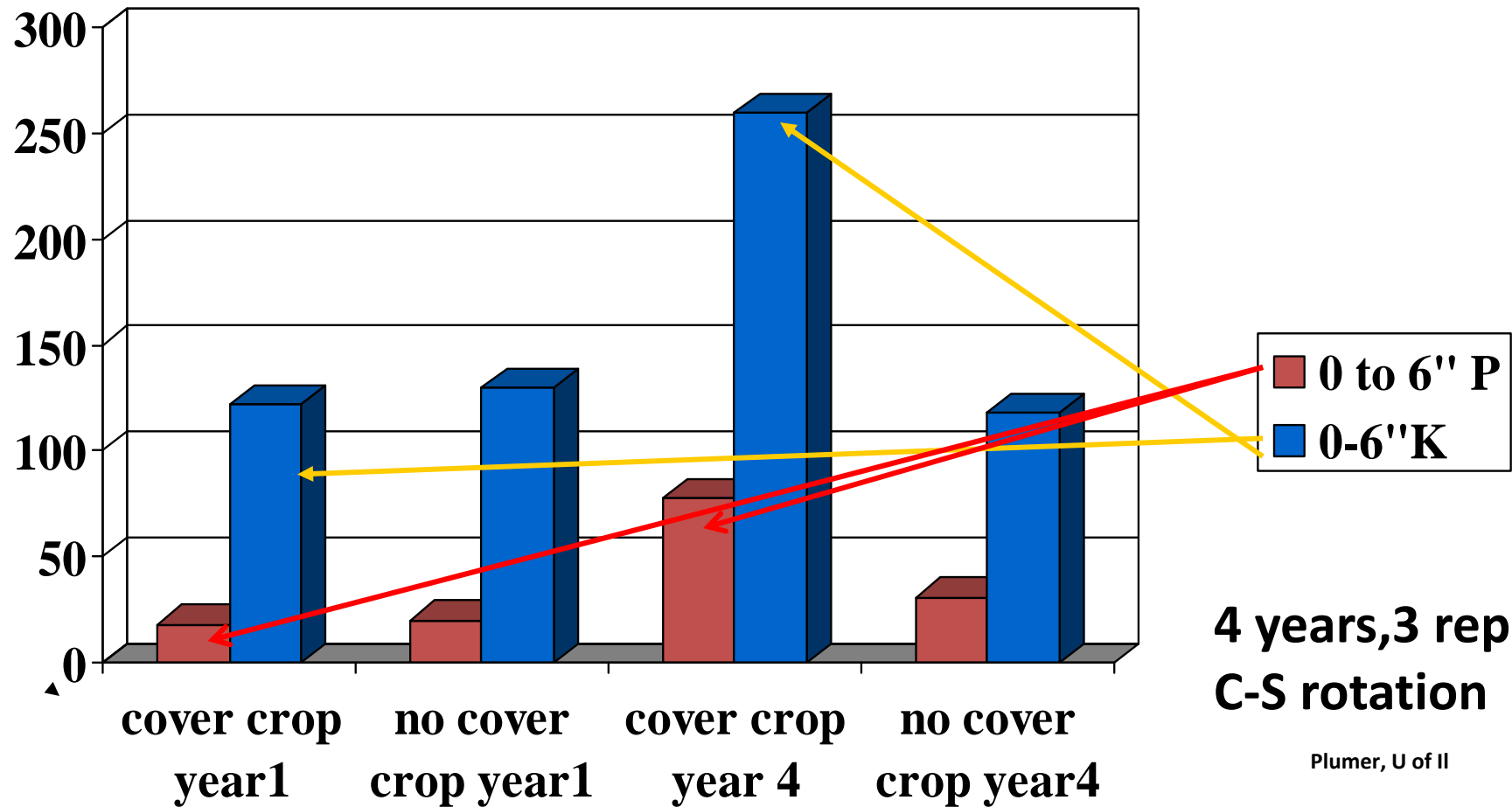
WEED CONTROL



Cereal rye

Plumer

Soil Tests in ryegrass Cover Crop



DISEASE CONTROL

| Treatment | SCN eggs/100cc Changes in Egg count | SDS Foliar Disease DX 8/26 | Foliar Disease AUDPC | Yield (bu/A) |
|-------------------------|--------------------------------------------------|----------------------------------|----------------------------|-----------------|
| Fallow (No winter crop) | +589 a | 25.2 a | 157.7 a | 65.4 b |
| Cover crop (rapeseed) | -313 b | 16.8 b | 103.9 a | 67.5 ab |
| Green manure (rapeseed) | -691 b | 5.5 c | 37.1 b | 69.6 a |
| <i>P > F</i> | .002 | .0001 | .001 | 0.07 |



Soybean Cyst Nematodes Egg Count

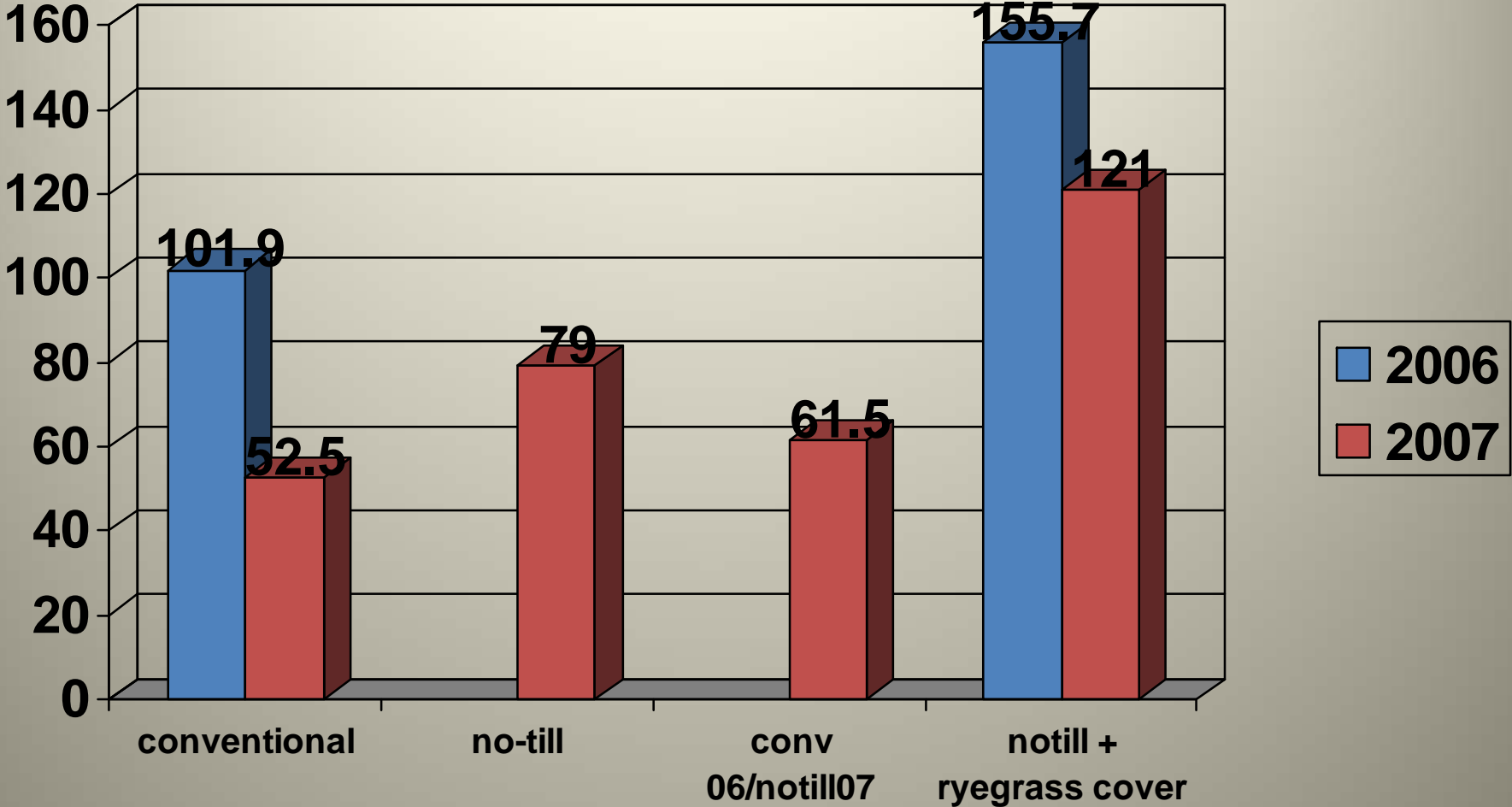
| | Bare | Cereal Rye | Annual Ryegrass |
|----|------|------------|-----------------|
| NW | 7533 | 717* | 117** |
| SW | 3650 | 320* | 0** |
| LF | 1559 | 722* | 386* |
| JA | 1202 | 390* | 279* |

Soybean
Cyst
nematode
suppression

| Treatment | NW Plot yield | SW Plot yield |
|-----------------|---------------|---------------|
| Bare soil | 48.9 | 48.2 |
| Cereal rye | 53.8 | 52.3 |
| Annual ryegrass | 55.7 | 60.6 |

Yield advantage

2007 3" rain-April-Oct.
Claypan soil



9 replications 2006
8 replications 2007

Effects in Dry Weather 2012



12 years cont. no-till corn + cover crop



Tillage and no cover crop

Herbicide Carryover Issues for planting cover crops

- No rain, no decomposition?
- No label directions?
- What are a concern
 - Atrazine
 - Princep
 - Calisto
 - Corvus
- Most sensitive is brassicas