

# Tillage Radish as a Soil Conditioning Cover Crop

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VALLEY CROPS  
Cover Crop Program

## Many Benefits of Cover Crops

INCREASE INFILTRATION  
REDUCE SOIL EROSION  
REDUCE COMPACTION  
ENHANCE NUTRIENT CYCLING  
IMPROVE SOIL STRUCTURE  
INCREASE ORGANIC MATTER  
WEED SUPPRESSION

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## Some Definitions

- *Raphanus sativus* is the species
- Types include:
  - Oilseed radish
    - Selected for oil, high seeding rate, low root production
  - Chinese/Japanese radish
  - Daikon radish
    - Selected for table quality, sprouts, human consumption
  - Forage radish or "Tillage Radish™"
    - Selected for root development, cover crop use

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## About the Plant

- Small seeded winter annual
  - Similar seed size to alfalfa
- When properly established develops large tap root
- Excellent nutrient scavenger (nitrogen, phosphorus, calcium)
- Winter-kills when temperatures dip to teens
- Residue "melts" forming excellent seedbed

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February 5, Rockingham



February 5, Rockingham



April 11, Rockingham

## Establishment Guidelines

- Plant 4 to 10 weeks before frost
  - In Valley no later than September 20-25
- Seeding rate
  - 8 to 10 lbs (alone)
  - 6 to 10 lbs (mix)
- Seeding depth
  - ¼ to ½ "
- Drilling seed is preferred

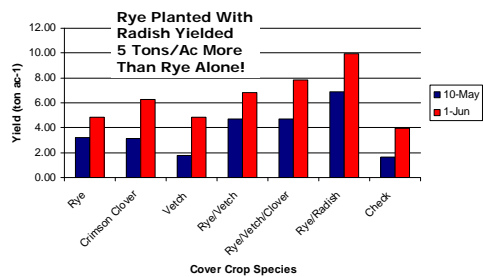
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## Establishment Guidelines

- Does well with 50 – 60 lbs N
  - Have never applied N in VA trials
  - Will likely scavenge residual N from corn crop
- Scavenged N will be released to following crop
  - Available more quickly than other cover crops
- Leaves no residue after winter-kill
  - Does very well with small grain (rye, barley)
  - Rye can still be harvested for silage

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## Rockingham County 2007



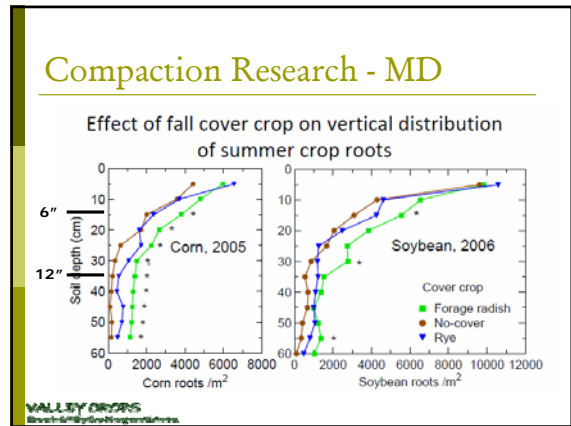
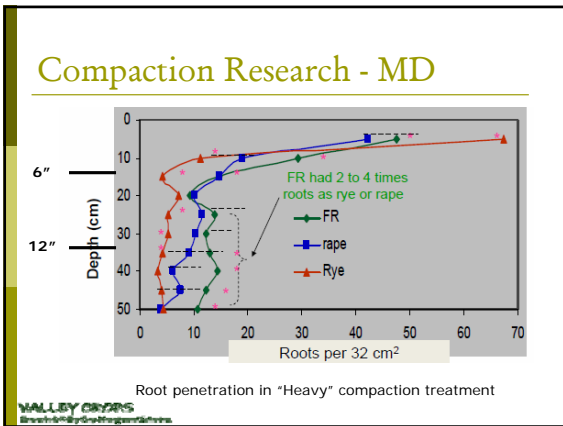
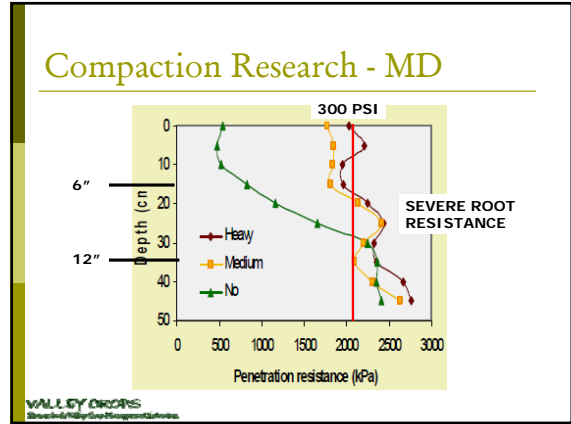
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September 26, Rockingham

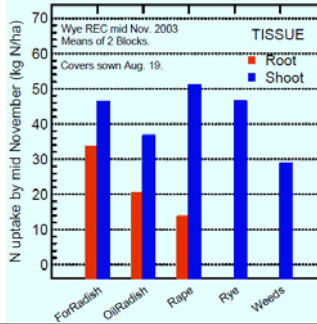


October 26, Rockingham



## Nitrogen Uptake - MD

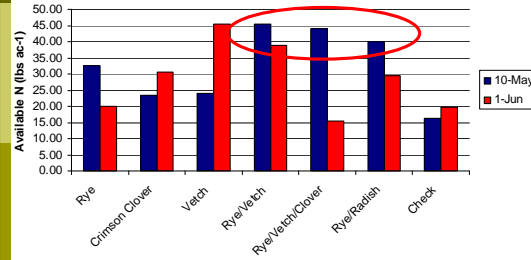
Nearly the Same N Uptake in the Roots as in Shoots



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Sustainable Crop Production Systems

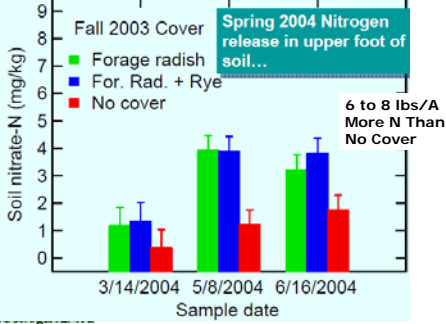
## Nitrogen Release - VA

As Much Soil N as legumes



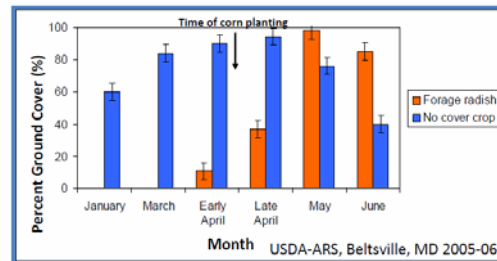
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## Nitrogen Release - MD

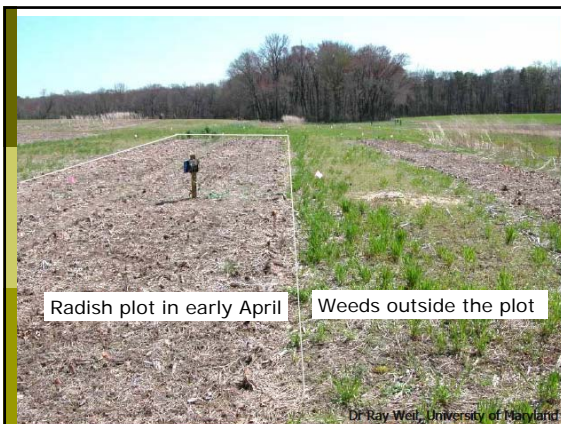


WALLEY CROPS  
Sustainable Crop Production Systems

## Weed Suppression

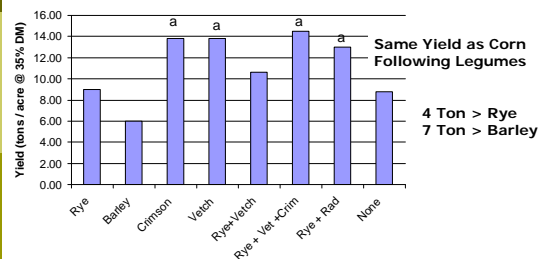


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## 2007 Corn Silage Yields - VA

No N Applied to Corn Crop!



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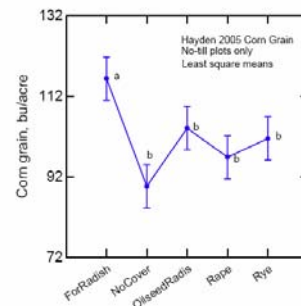
## 2007 Corn Silage Yields - VA

- 2007 extremely dry
- Radish roots penetrated up to 2 feet, opening huge macropores (big holes)
- Radishes scavenged lots of N in their tap root, which upon rotting was released to the corn
- Also improved the WUE of the corn crop

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Sustainable Crop Management Solutions



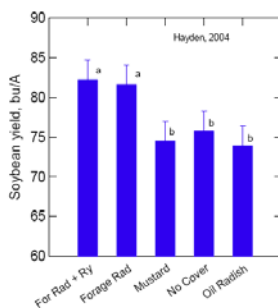
## 2005 Corn Grain Yields - MD



Nearly 20 Bu/Acre  
Yield Advantage  
Over Rye, Rape,  
Oilseed or No Cover

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## 2004 Soybean Yields - MD



Over 7 Bu/Acre  
Yield Advantage  
Above Other Covers

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## Why The Yield Advantages?

- Documented compaction relief
  - More crop roots
  - Deeper crop roots
- Greater crop water use efficiency
  - Roots can follow holes left by rotting radish
- Nitrogen availability
  - Fall scavenged N is rapidly available to spring crop
- Microbiological impacts?
  - Huge impact on soil mycorrhiza

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