

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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Cover Crop Program



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

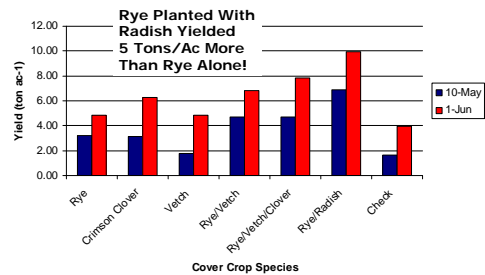
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Establishment Guidelines

- 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



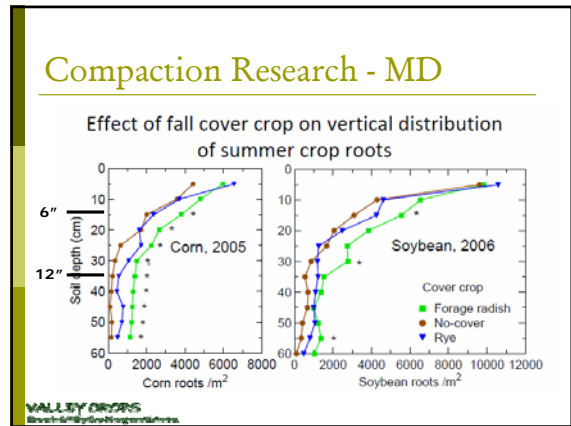
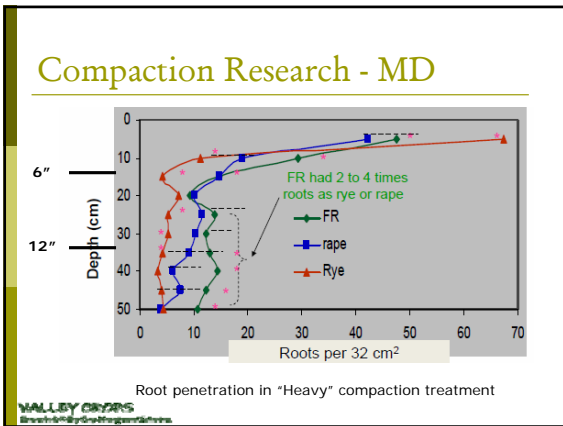
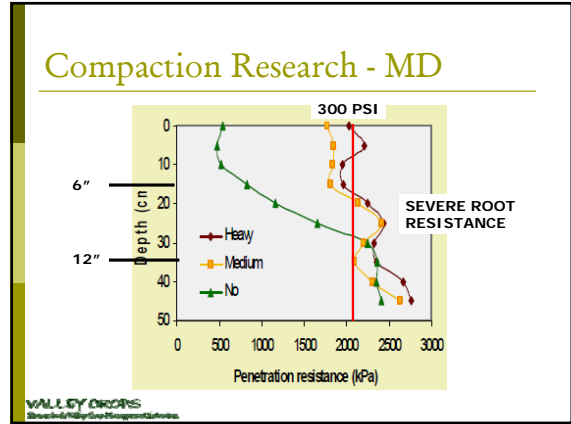
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September 26, Rockingham

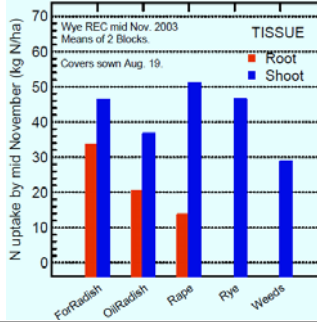


October 26, Rockingham



Nitrogen Uptake - MD

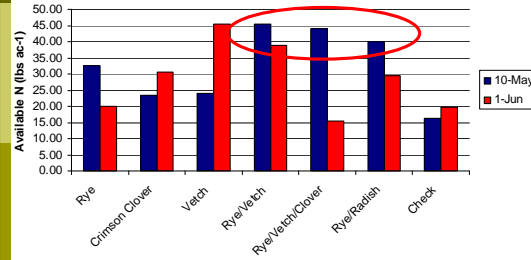
Nearly the Same N Uptake in the Roots as in Shoots



WALLEY CROPS
Sustainable Crop Production Systems

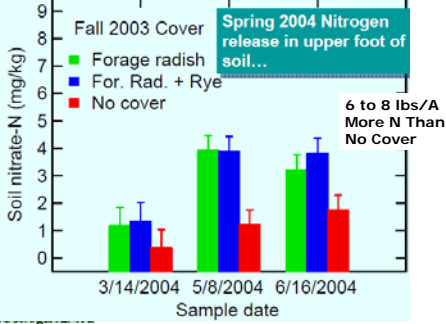
Nitrogen Release - VA

As Much Soil N as legumes



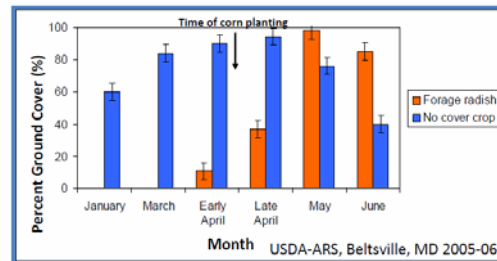
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Nitrogen Release - MD

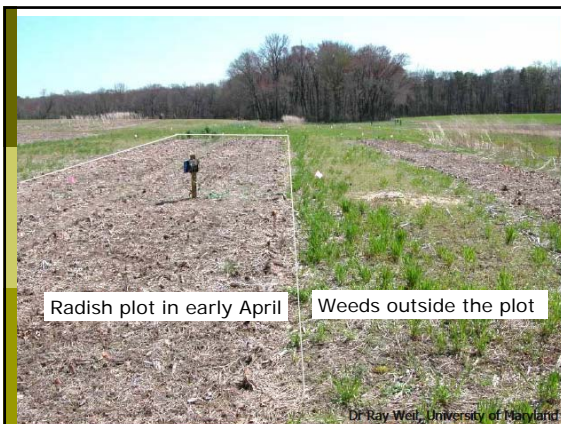


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Sustainable Crop Production Systems

Weed Suppression

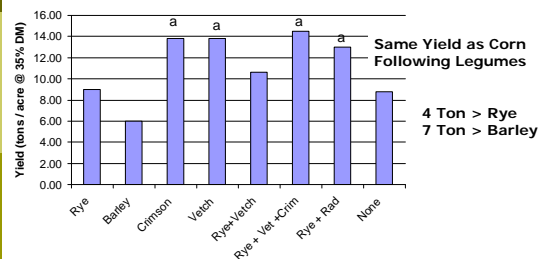


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2007 Corn Silage Yields - VA

No N Applied to Corn Crop!



WALLEY CROPS
Sustainable Crop Production Systems

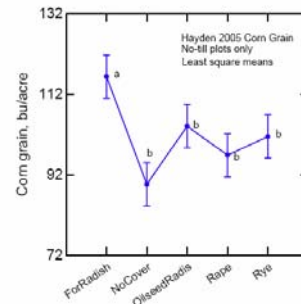
2007 Corn Silage Yields - VA

- 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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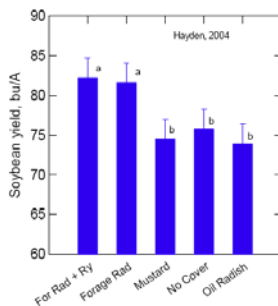
2005 Corn Grain Yields - MD



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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