

# Organicology

## Cover Crops for Vegetable Rotations

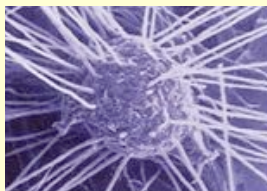
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## Identify Your Objective

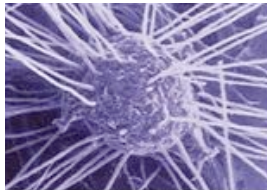


<http://www.mycro-labs.com/>

### Cover Crop Benefits

- Provide nitrogen
- Add organic matter
- Improve soil structure
- Reduce erosion
- Provide weed control
- Reduce nutrient leaching
- Improve mycorrhizal winter survival
- Provide nectar & pollen for beneficial insects

# Identify Your Objective

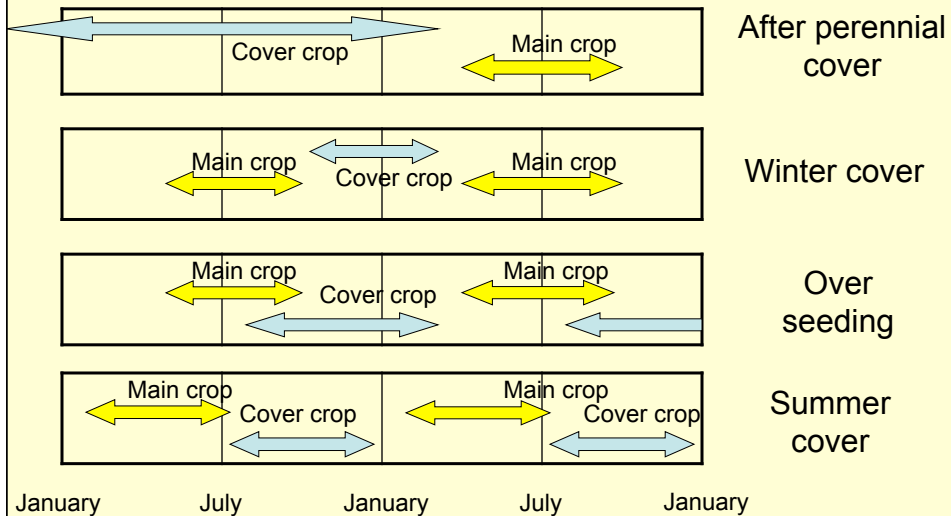


<http://www.mvco-labs.com/>

## Cover Cropping Challenges

- Cost of seed and labor
- Establishment when seeded after harvest may be poor
- Bed preparation for early spring crops may be difficult with a lot of residue
- Requires skilled management and labor, equipment use and possible irrigation during busy times
- Plan for success

# Identify the Niche



Adapted from Building Soils for Better Crops, F. Magdoff & H van Ess,

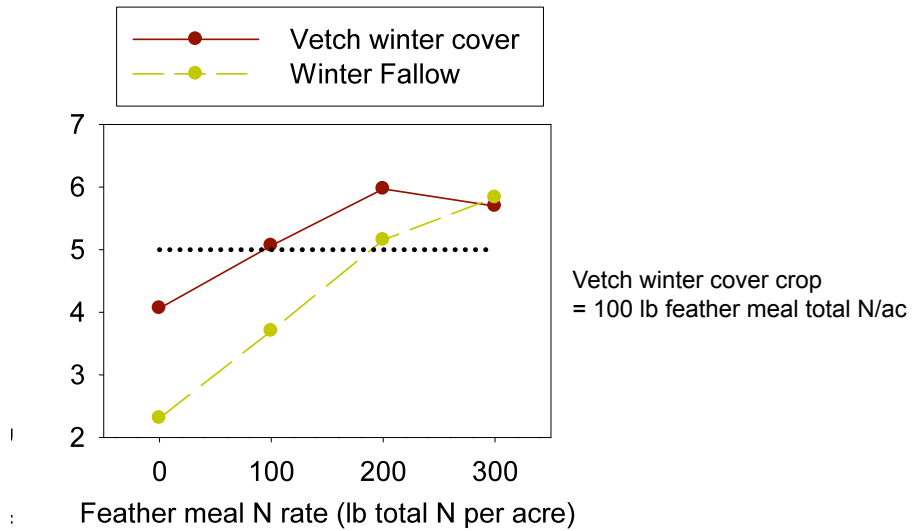
## Cover Crop Characteristics

- Legumes: clovers, vetches, peas, beans
  - Fix atmospheric N with *Rhizobia*
  - Put on most biomass in the spring
  - Provide flowers for beneficial insects
- Grasses: oats, rye, wheat, triticale
  - Scavenge soil N in the fall
  - Provide C and build O.M.
- Forbs: buckwheat, phacelia, mustards
  - Scavenge soil N
  - Provide C and build O.M.
  - Provide flowers for beneficial insects

## Some Cover Crop Species by Niche

Summer	Winter	Overseed	Perennial
<ul style="list-style-type: none"> <li>• Soybean</li> <li>• Cowpeas</li> <li>• Vetch</li> <li>• Sudhan grass</li> <li>• Spring cereals</li> <li>• Buckwheat</li> <li>• Millet</li> <li>• Phacelia</li> </ul>	<ul style="list-style-type: none"> <li>• Red, white, sweet &amp; crimson clover</li> <li>• Vetch</li> <li>• Field peas</li> <li>• Fava beans</li> <li>• Winter cereals</li> <li>• Phacelia</li> <li>• Mustard</li> </ul>	<ul style="list-style-type: none"> <li>• Red, white, sweet &amp; crimson clover</li> <li>• Vetch</li> <li>• Annual ryegrass</li> <li>• Cereal rye</li> </ul>	<ul style="list-style-type: none"> <li>• Red, white &amp; sub clover</li> <li>• Perennial ryegrass</li> <li>• Fescue</li> <li>• Orchard grass</li> </ul>

## Fertilizer N equivalency of winter vetch cover crop for summer organic broccoli



Courtesy of Dan Sullivan

Garrett and Luna, 2007  
Lewis Brown farm

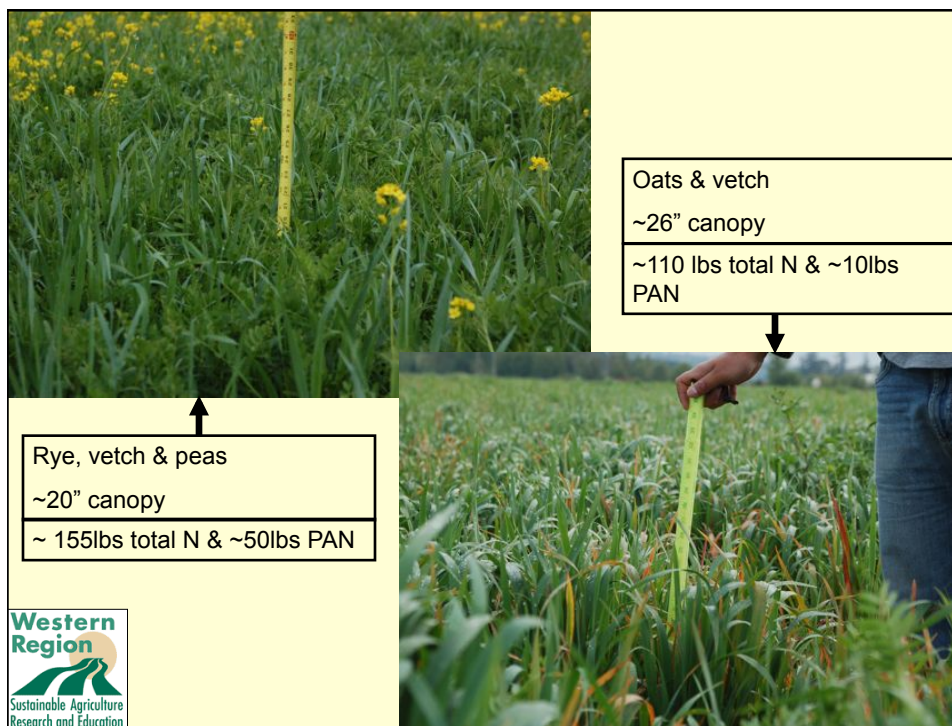
## Bottom line for cover crop nitrogen

- > Cost of seed & field work\* ~\$75.00
- > Total N-contribution ~150 lbs
- > Estimated PAN ~45 lbs
- > Cost of 1 lb PAN ~\$1.67/lb
- > Other benefits \$???
- > better weed control
- > improved soil structure
- > enhanced mycorrhizal survival
- > pollen, nectar, beneficial habitat, etc.
- > reduced nutrient leaching
- > reduced soil erosion

\*OSU Organic Vegetable Enterprise Budgets EM 8927, 8929 & 8931


## Can you afford to rely on fertilizer alone?

Product	\$/ton	Total % N	Est'd % PAN	\$/lb PAN	\$/100 lbs PAN
Urea (not organic)	\$500	46%	100%	\$0.54	\$54
	\$1000	46%	100%	\$1.09	\$109
Processed chicken manure	\$200	4%	50%	\$5.00	\$500
	\$250	4%	50%	\$6.25	\$625
Cover crop				\$1.70	



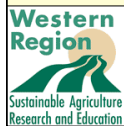
Oats & vetch  
~26" canopy  
~110 lbs total N & ~10lbs PAN

Rye, vetch & peas  
~20" canopy  
~ 155lbs total N & ~50lbs PAN



## Estimating N-contribution from cover crops

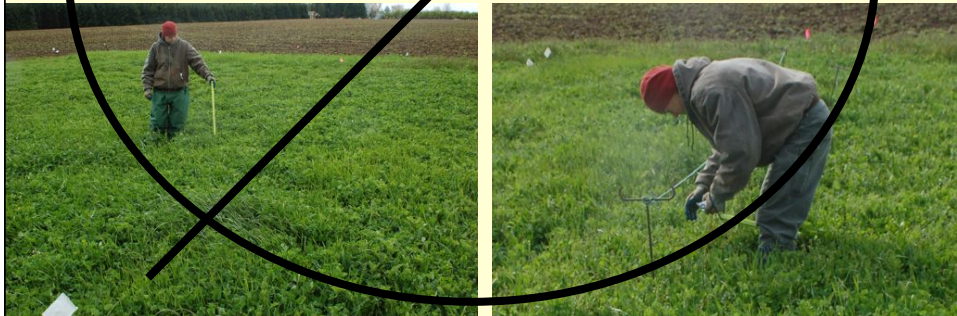
1. 2' x 2' quadrats
2. Cut cover crop to ground
3. Weigh total sample
4. Mix well and weigh subsample
5. Dry & test for C/N in lab

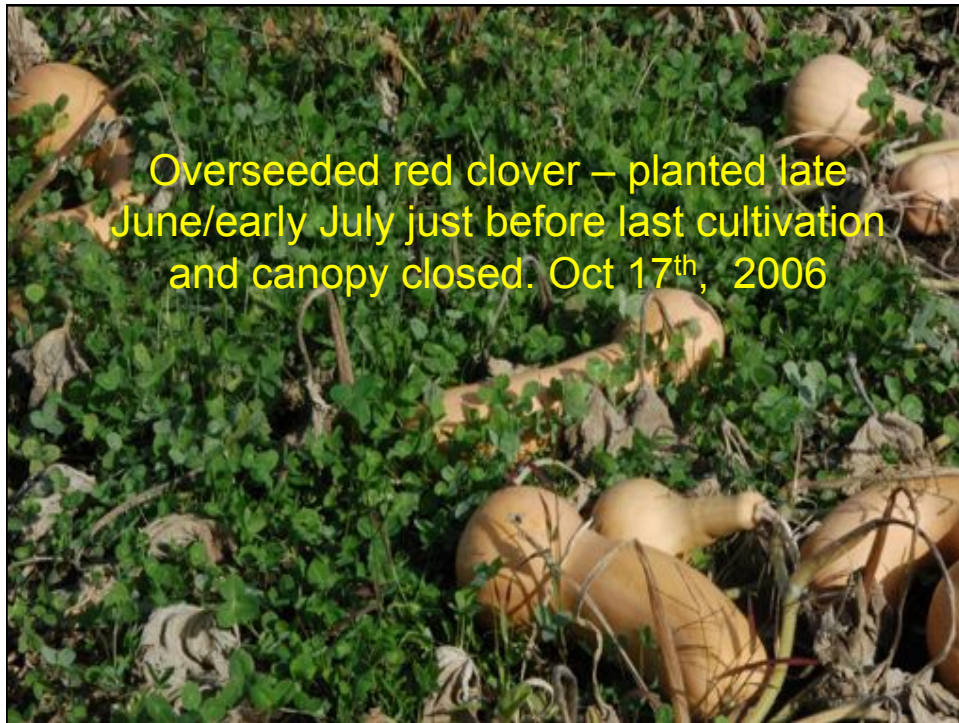
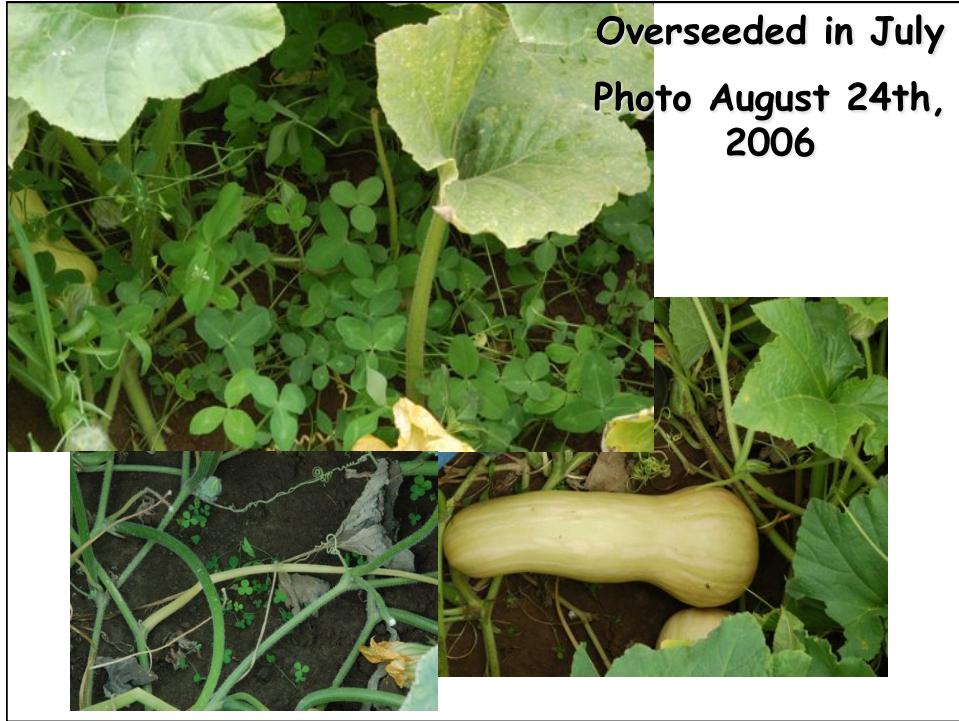


## Estimating N-contribution from cover crops

### 5. Canopy ht. & density

visions of a "pasture stick" for cover crops





Overseeded red clover April 5<sup>th</sup>,  
2007



Summer cover - Sudhan Grass – planted  
late June, photo July 27<sup>th</sup> 2006

## Sudhan grass Sept 12<sup>th</sup>, 2006



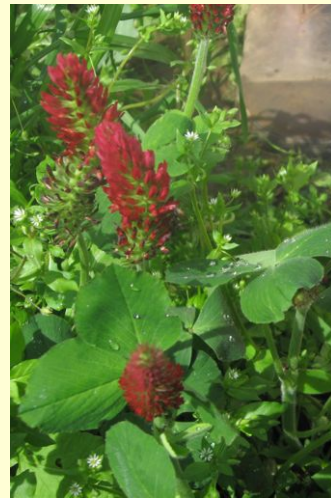
## Cover crops can provide good adult food sources at critical times



Common vetch

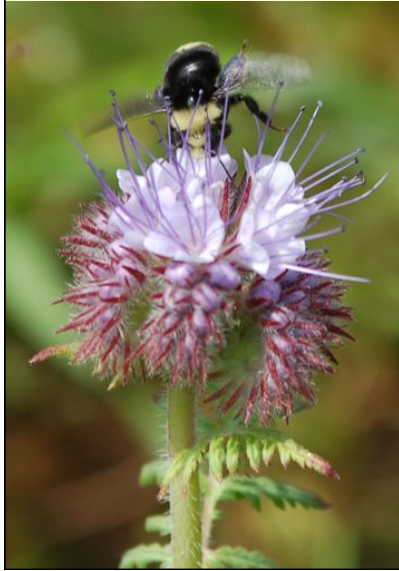


Wild mustard



Crimson clover & chickweed

Phacelia tanacetifolia  
native - boraginaceae fam.



Rice hulls facilitate seeding