Farmer Perspectives on Cover Crop Breeding

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Cover crops

- Planted on only 3% of cropland
  - USDA Nat’l Agriculture Statistics Service
- Less breeding, unlike cash crops
- Cover crop acres/farm tripled since 2010
- OREI grant for cover crop improvement
- Goal: quantify farmer interest in cover crops/breeding
Survey to determine breeding needs

- Survey open over March 2015
- 417 full responses, 504 partial
- 299,000 farmed acres represented
Survey distribution

- NRCS Twitter feed to share link
  - 42% of responses on day of the tweet
- Organic networks
- 90% of responses in first 8 days
  - “Fresh in the inbox” phenomenon

Image: www.bovinevetonline.com
Demographic results

- Hardiness zones 3 to 10
  - Covering USA
- 26 states represented
  - CA = 13% of responses
  - NY = 26% of responses
- 68% were organic
- 87% used cover crops
- Note: farmers who chose to respond are likely a self-selecting group, likely more interested in cover crops and caring enough to answer a survey.

http://www.planthardiness.ars.usda.gov/
Main crops grown

- Grains: 51%
- Vegetables: 48%
- Forages: 44%

Note: farmers could choose multiple, thus percentages add to more than 100%.
Factors limiting performance

The top limiting factor is poor establishment.
Nearly 90% of organic farmers chose N fixation as a reason, compared with 40% of conventional.
We had 4 “focus” cover crop varieties in the survey that served as specific examples to learn about the importance of various traits; if farmers indicated that they grew one of these varieties they were directed to a survey page that looked like this one, for hairy vetch.

<table>
<thead>
<tr>
<th>Trait</th>
<th>Not at all Important</th>
<th>Very Unimportant</th>
<th>Neither Important nor Unimportant</th>
<th>Very Important</th>
<th>Extremely Important</th>
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<td>Early vigor and quick</td>
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<td>establishment</td>
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<td>Winter hardiness</td>
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<td>Early maturity</td>
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<td>Nitrogen fixation</td>
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<td>Disease resistance</td>
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<td>Biomass production</td>
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<td>Weed suppression</td>
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<td>No hard seed</td>
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<td>Other</td>
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For Hairy vetch, rate the importance of the following traits:
Importance of cover crop traits

This graph shows the percentage of respondents who rated the given traits as “important” or “very important” for three legumes and cereal rye.
What’s striking here: more organic farmers report willing to spend over $75/acre on cover crop seed. This suggests that there is high demand for niche cover crop seed among organic farmers and shows their willingness to pay more for expensive varieties. This may also be because organic farmers see cover crops as an especially important management option.
Farmers’ perspectives

* Indicates significant differences between organic and conventional respondents
“Hairy vetch that establishes faster for more biomass to green manure first half of April.”

“Need to work out the crop insurance issues. Presently cover crops are not an approved practice.”

“I have grown a cover crop every winter for 38 yr’s. It is the most important crop I grow.”
Conclusions

- N-fixation very important in cover crops
- Organic farmers are willing to spend more on seed
- The work for legume cover crop breeding begins:
  - OREI: Creating the cover crops that organic farmers need: delivering regionally adapted varieties across America
Acknowledgements

- USDA National Institute of Food and Agriculture, Hatch Project 2013-14-425: Expanding the role of cover crops in sustainable cropping systems
Thank you for your interest!

One final opinion from a respondent:

“I think everyone over analyses [sic] cover crops...their propose [sic] is to feed the soil biology. I've been growing cover crops since 1998. Soil care takers need to feed their soils carbon, with green leaves. PERIOD / / I like farming / /”