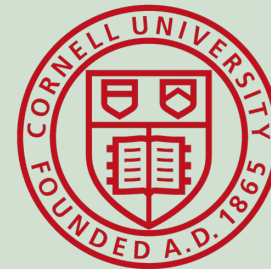


Farmer Perspectives on Cover Crop Breeding

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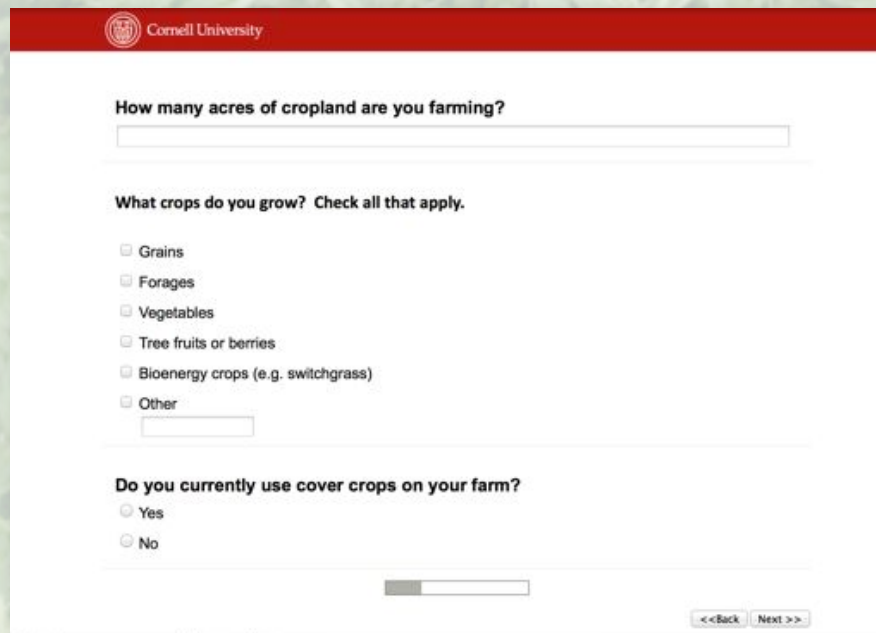
Cover crops

- 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



The screenshot shows a web-based survey form from Cornell University. The header is a red bar with the Cornell University logo and name. The form contains three main sections: a text input field for 'How many acres of cropland are you farming?', a list of crop types with checkboxes for 'Grains', 'Forages', 'Vegetables', 'Tree fruits or berries', 'Bioenergy crops (e.g. switchgrass)', and 'Other' (with a text input field), and a radio button section for 'Do you currently use cover crops on your farm?' with options 'Yes' and 'No'. At the bottom, there is a progress bar and navigation buttons labeled '<<Back' and 'Next >>'.

Cornell University

How many acres of cropland are you farming?

What crops do you grow? Check all that apply.

☐ Grains

☐ Forages

☐ Vegetables

☐ Tree fruits or berries

☐ Bioenergy crops (e.g. switchgrass)

☐ Other

Do you currently use cover crops on your farm?

☐ Yes

☐ No

<<Back Next >>

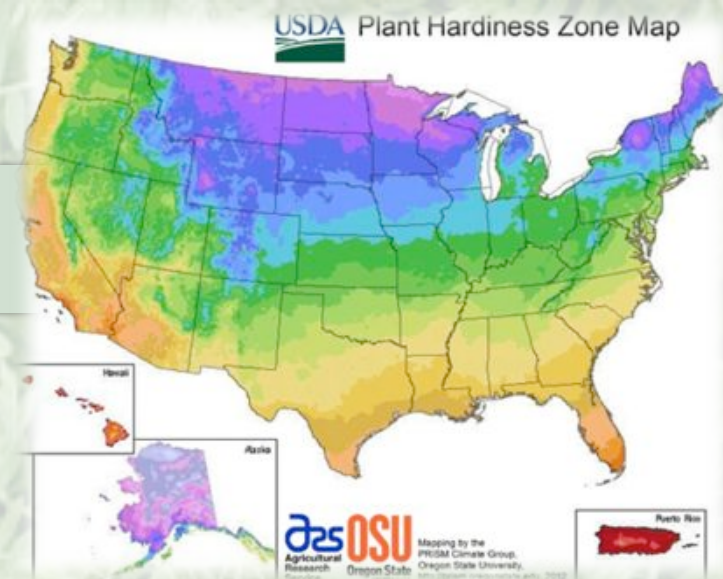
Survey distribution

- 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



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.



Main crops grown

Grains
51%



Vegetables
48%



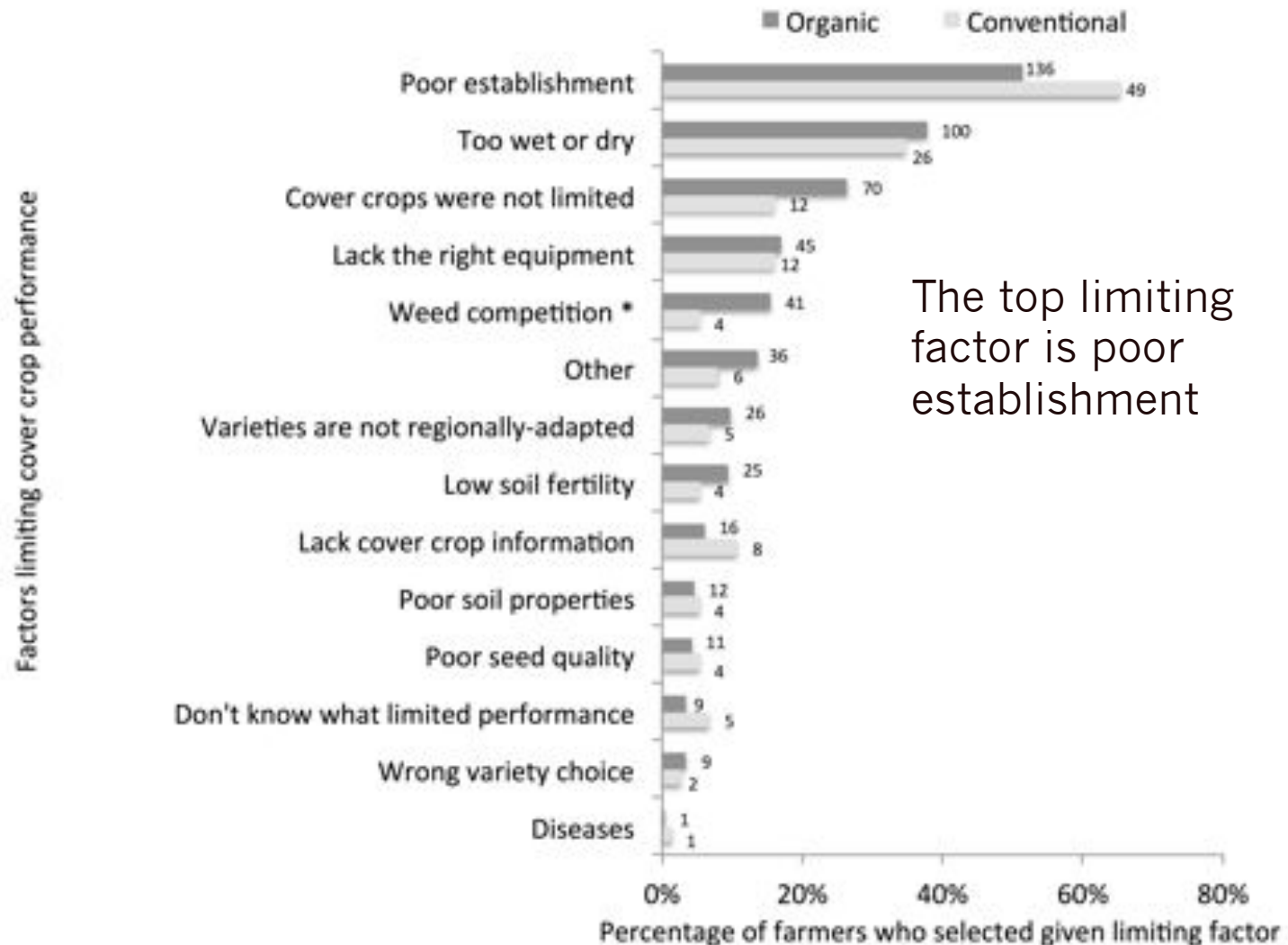
Forages
44%



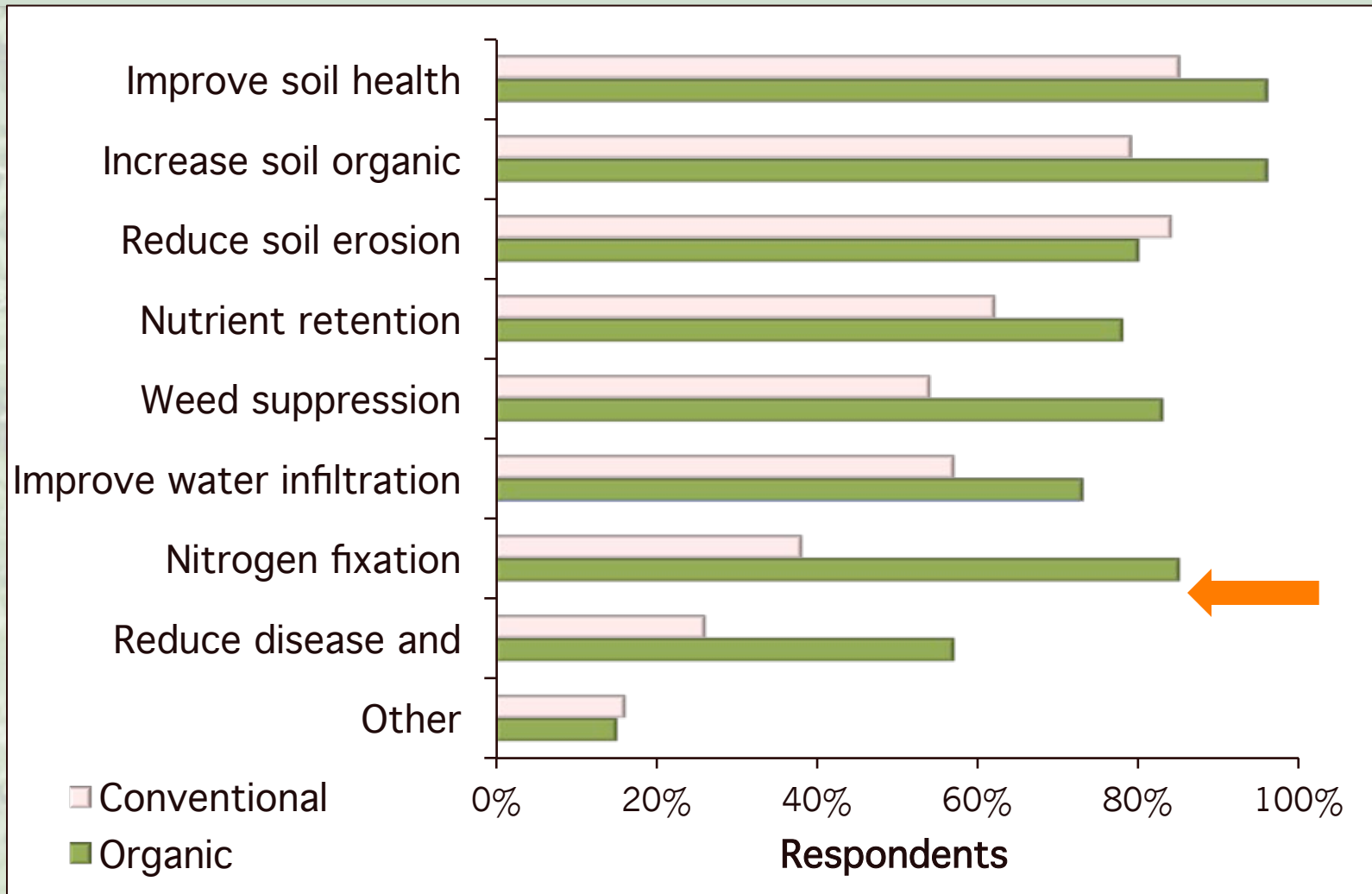
dzshoppie.com

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

Factors limiting performance



Reasons for cover cropping



Nearly 90% of organic farmers chose N fixation as a reason, compared with 40% of conventional

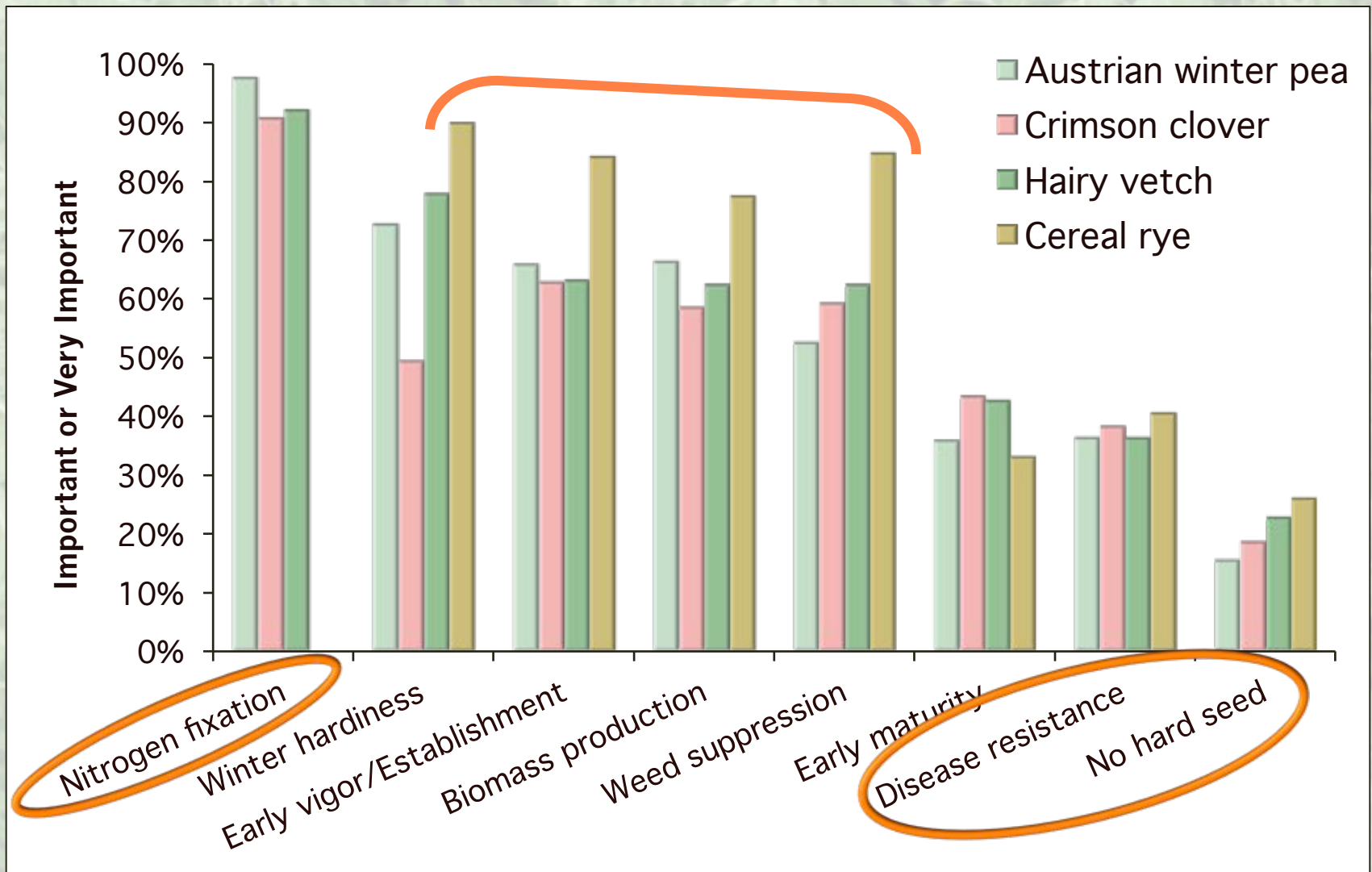
Traits for specified cover crops

For **Hairy vetch**, rate the importance of the following traits:

	Not at all Important	Very Unimportant	Neither Important nor Unimportant	Very Important	Extremely Important
Early vigor and quick establishment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Winter hardiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Early maturity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nitrogen fixation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Disease resistance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biomass production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weed suppression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No hard seed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

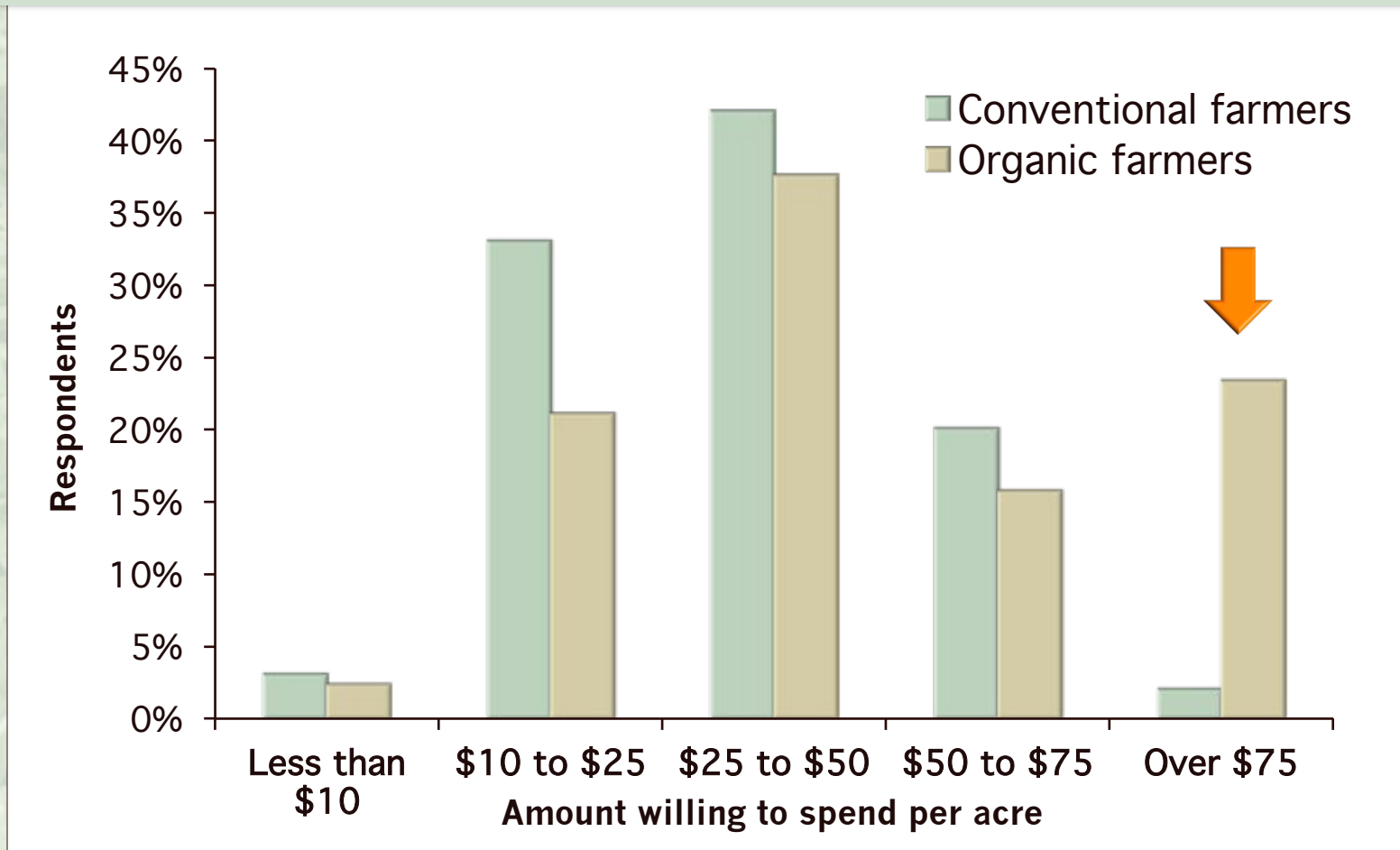
We had 4 “focus” cover crop varieties in the survey that served as specific examples to learn about the importance of various traits; if farmers indicated that they grew one of these varieties they were directed to a survey page that looked like this one, for hairy vetch.

Importance of cover crop traits



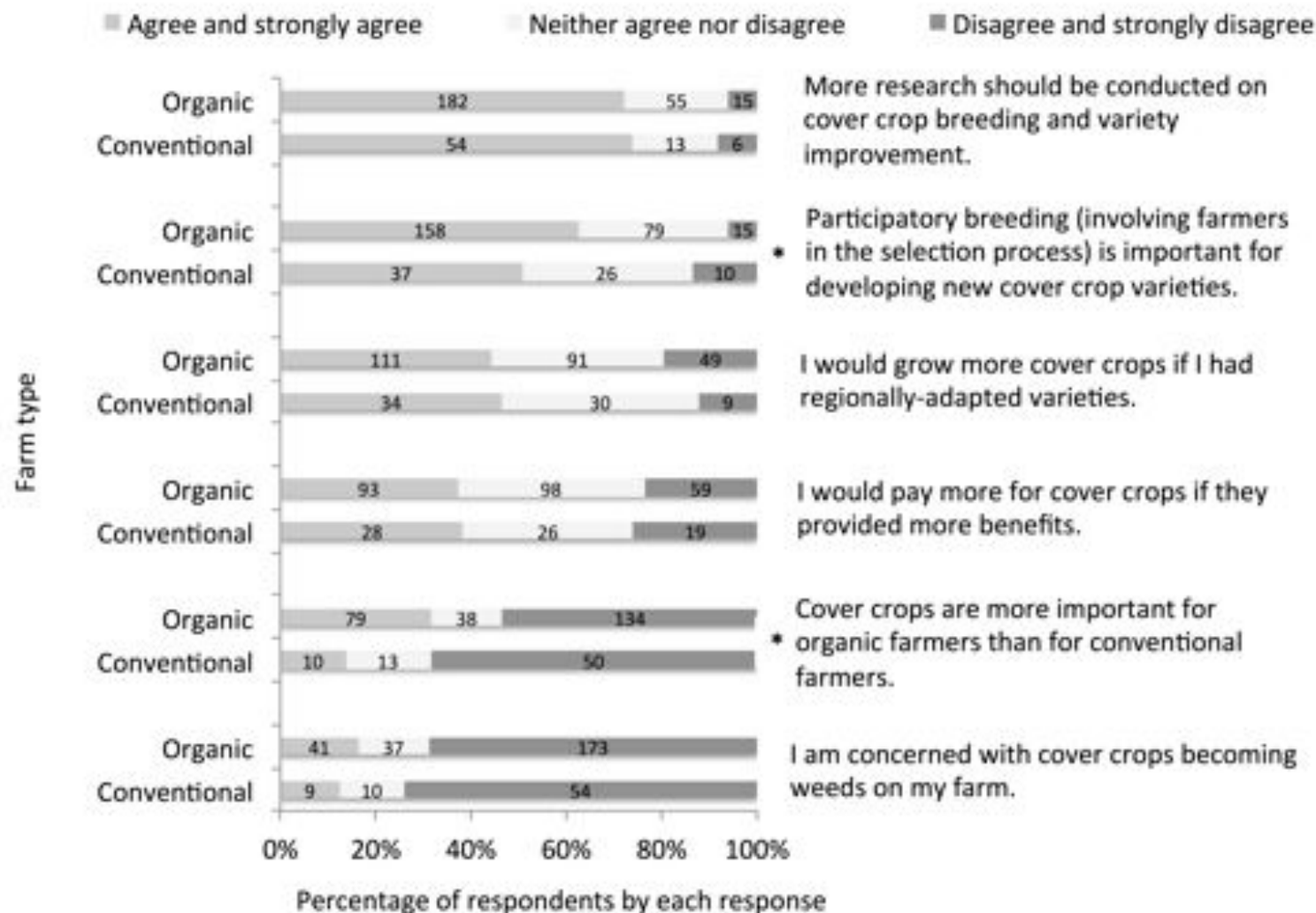
This graph shows the percentage of respondents who rated the given traits as "important" or "very important" for three legumes and cereal rye.

Amount willing to spend on seed



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

Open response box at survey's end

- “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 / /”

