SUSTAINABLE CROPPING SYSTEMS LAB

Perennial Rye for New York

Small Grains Field Day, June 7th, 2018
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Perennial cereal rye (*Secale cereale*) is a cross between perennial mountain rye (*Secale strictum*, formerly *Secale montanum*) and annual cereal rye (*Secale cereale*). Perennial cereal rye originated in Germany in the 1960s, and was further developed as a variety known as ACE-1 in the 1990s at the Alberta-based Lethbridge Research and Development Centre in Canada. Perennial cereal rye produces grain, similar to annual cereal rye, but also produces perennial underground stems called rhizomes from which new shoots develop. Perennial cereal rye provides year-round soil cover. It is therefore particularly well suited for erosion mitigation on marginal lands. While perennial cereal rye currently produces lower grain yields than annual cereal rye, largely because of the dedication of energy to rhizome production, yield improvements are expected in the future.

Compared to annuals, perennial grain crops have several important benefits and drawbacks

Benefits

- Yearly planting unnecessary
- Deeper roots
- Helps reduce erosion
- Year-round ground cover

Drawbacks

- Lower grain yields than annual counterparts
- Potential build up of pests and pathogens

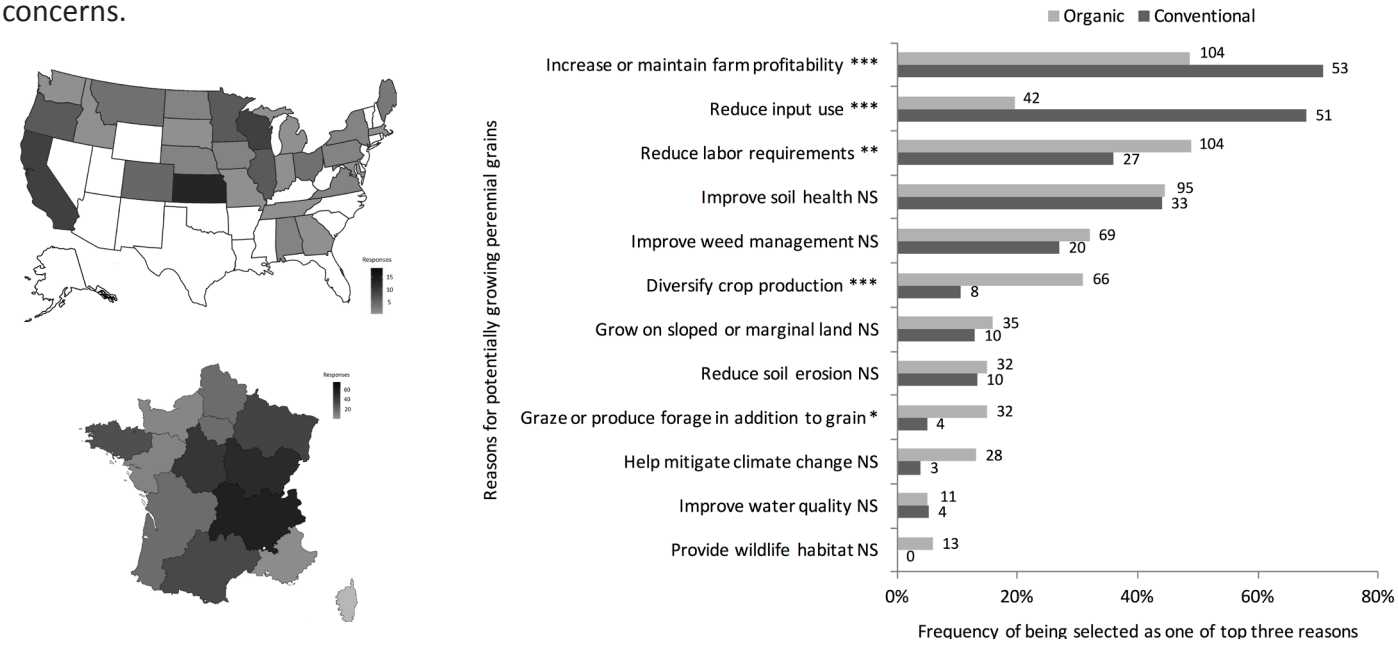
Our focus areas of perennial cereal rye research:

- Optimizing crop production
- Effects on soil health and erosion
- Legume intercropping
- Grower and processor perceptions of production and use
- Disease incidence and weed competition

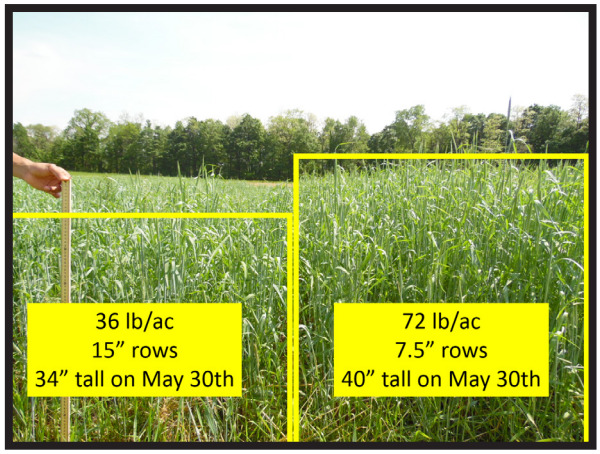
ACE-1 perennial cereal rye photos from top left clockwise: seedling one month after planting (Sept 28 2016), near anthesis stage in Newfield NY (June 8 2017), ready for harvest (Aug 17 2017), harvested grain, 100% whole grain bread, regrowth after 1st harvest year (Dec 21 2017).

Grower Survey Results

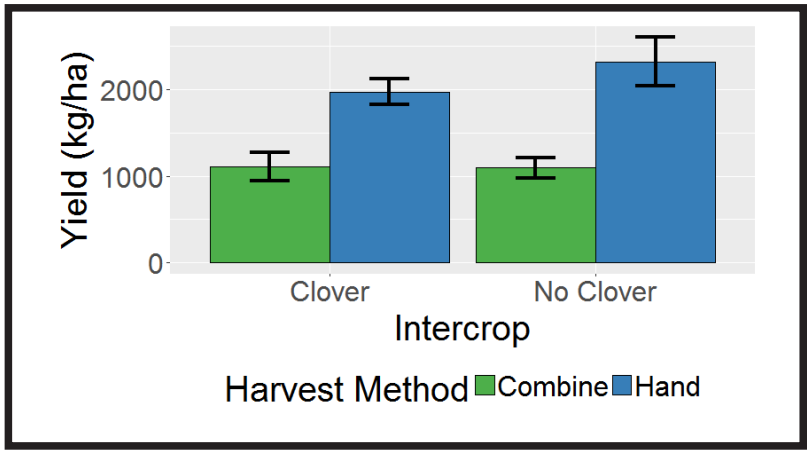
We conducted an on-line survey of farmers and grain processors in the US and France to gauge current interest in perennial grains. Increased profitability, reduced inputs, and reduced labor were cited as top motivations for growing perennial grains; increased pest problems, low yield, cost of seed, and lack of markets were reported concerns.



Above Left: Survey responses by state and region from 88 US and 319 French farmers. Above Right: Percentages of organic (n=216) and conventional (n=75) farmers who selected the given motivations when asked the question, "*Please rank the top 3 reasons why you might be interested in growing perennial grains.*"



Perennial cereal rye grown at a 15" row spacing and half seeding rate was noticeably shorter at heading than rye grown at the standard spacing and rate.



Yields of perennial cereal rye without medium red clover were as high as 2250 kg/ha during the first growing season. Yield loss from lodging is the primary cause of the discrepancy between hand-harvested and combine yields. Seeding rate = 71 lb/ac.

Learn more on our website: https://blogs.cornell.edu/scslab/

Questions? Feel free to contact us for more information about this experiment or to hear about our other research. Sustainable Cropping Systems Lab, Sandra Wayman sw783@cornell.edu, Eugene Law epl49@cornell.edu, Cynthia Bartel cab83@cornell.edu.

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