

# Cover crop mulches tested for no-till organic onions

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Onion bulbs in remaining cowpea residue mulch are ready for harvest. Credit: Photo by Emily Vollmer

Conservation tillage encompasses a range of techniques for establishing crops in the previous crop's residues, which are purposely left on the soil surface. The principal benefits of conservation tillage are improved water conservation and the reduction of soil erosion; additional benefits can include reduced fuel consumption, planting and harvesting flexibility, and reduced labor requirements. A new study published in *HortScience* finds promise in a common legume used as an effective crop cover for organically produced onions.

Conservation tillage promotes soil quality and fertility in accordance with organic principles, but the practice can be challenging. Success of

conservation tillage in organic systems is highly influenced by factors such as [crop rotation](#) for weed and disease control and nitrogen availability. Surface residues in these systems are usually made up of unharvested crop remains or cover crops that were killed with herbicides (or, in the case of organics, by mechanical methods).

Researchers at North Carolina State University recently released the results of a 2-year experiment designed to assess the efficacy of summer annual grass (foxtail millet) and legume (cowpea) cover crops in different mixture ratios or monocultures. The researchers also analyzed rates of soybean meal as nitrogen amendment on overwintered, no-till, organically managed onion production. Foxtail millet and cowpea were compared with a bare-ground control for weed suppression and nitrogen contribution when followed by organically managed no-till bulb onion production

Cover crop treatments were grown during the summer (July through October) followed by no-till transplanted onions in the fall for overwinter production (November to May). The field experiment was managed according to the U.S. National Organic Program production standards. Cover crop treatments of cowpea and bare ground had the greatest total marketable onion yield both years of the experiments. When supplemental baled millet was applied, however, onion mortality was more than 50%, a result the researchers attributed to the mulch thickness.

The researchers stated that "cowpea shows promise as a summer cover crop used as a residue-mulch for fall planted crops such as overwintered onion. Cowpea produced comparable onion yields to bare ground in both years of the experiment." They noted that, although cowpea had high weed interference, hand-weeding twice was sufficient to maintain onion yields.

Foxtail millet did not function as well as cowpea as a mulch for overwintered onions. According to Emily Vollmer, who led the study; "It appeared that ground coverage and thickness of the grass residue negatively affected onion plant stand and overall yield. Millet in a mixture with cowpea either reduced onion yield or had comparable yield to cowpea as a monocrop." While foxtail millet can perform well as a cover crop when planted in early summer, it was stunted by foliar disease when planted after mid-July, making it a poor choice for a midsummer-seeded cover crop in eastern North Carolina.

Soybean meal showed potential as an effective source of nitrogen even when surface-applied in cool weather months. The study showed that nitrogen would be available for plant uptake in less than 2 weeks after surface-applying soybean meal, which facilitates the use of soybean meal in multiple applications tailored to timing of crop plant demand. The scientists added that split applications of soybean meal could be an important improvement in nitrogen management to better meet increased demand for nitrogen uptake during bulb initiation and growth in the spring.

**More information:** The complete study and abstract are available on the ASHS HortScience electronic journal web site:

[hortsci.ashspublications.org/c ... ent/abstract/45/1/61](https://hortsci.ashspublications.org/content/abstract/45/1/61)

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