Does planting timing of green mulches affect yield of garlic and labour?

In A Nutshell

This project compared yield and labour for garlic planted into established oats, garlic and oats planted together, and garlic without a cover crop.

Key Findings:

- Garlic survival and proportion of medium garlic was highest when garlic was planted with oats or into bare soil (control), and lowest when garlic was planted into an established oat cover crop.
- Garlic planted into an established cover crop required more planting labour and delayed emergence. Delayed emergence, in turn, delayed weeding and allowed perennial species to establish.
- Eric won't use the oat treatments as tested again; but seeing the biomass of the early oat planting has motivated him to tweak the system to make it work.

RESULTS

Seed Quantity: Yield

- Garlic that was planted at the same time as oats (late oats) and planted without a cover crop (bare) had similar survival of around 50%. Garlic planted into an established cover crop (early oats) had lower survival of 26% (Figure 2).

Seed Quality: Size Class

- Total large+XL and medium-sized garlic was greatest when planted with late oats and with no cover crop.
- Garlic planted after early oats had 35% less medium garlic and 22% less large+XL garlic (Figure 2).

TAKE HOME MESSAGE

Using oats as a winterkill mulch for garlic is a compelling idea to keep living roots in the ground in the fall and reduce weed pressure the next growing season.

For garlic planted with oats, yield and quality were similar to the bare soil control. The oats grew a small amount of biomass in the fall but decomposed in the spring.

Seedling oats early and planting garlic into an established cover crop resulted in lower garlic yield and lower quality. While early oats produced a nice mulch, management was harder since planting through the oats took twice as long and perennial grasses established, making weed control more difficult.

NEXT STEPS

Eric will not use the specific methods he tested again but is keen to try planting garlic at the same time as an early oat cover crop.

He was excited by the oat establishment, but will consider planting oats in 4 widely spaced rows that will allow for easier planting and mechanical weed control.

Before he tries this, however, he wants to figure out ways of removing the cover crop residue in the spring so that garlic emergence is not delayed.

**Table 1**

Management differences among the two oat cover crop treatments and bare soil control.

<table>
<thead>
<tr>
<th>Trt</th>
<th>Oat establishment</th>
<th>Garlic planting</th>
<th>Spring soil</th>
<th>Weeds present</th>
<th>Perennial grasses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early oats</td>
<td>Great, but planting garlic cramped and killed oats early (photo below)</td>
<td>2x as long to find holes; more force needed</td>
<td>Residue delayed emergence and first weeding</td>
<td>Easy</td>
<td>Perennial grasses</td>
</tr>
<tr>
<td>Late oats</td>
<td>Didn't grow enough to establish cover</td>
<td>Easy</td>
<td>Bare</td>
<td>Pigweed, lambsquarters</td>
<td>Bare</td>
</tr>
<tr>
<td>Bare</td>
<td>N/A</td>
<td>Easy</td>
<td>Bare</td>
<td>Pigweed, lambsquarters</td>
<td>Bare</td>
</tr>
</tbody>
</table>

**Figure 1.** Layout of Eric’s trial with 6 beds, 3 rows of garlic and 3 sections per bed, each with a randomly assigned variety. This is a semi-randomized design and each variety is a replicate. Treatments: Early oats, late oats, and no cover crop control.

**Figure 2.** Percent survival of garlic planted for each treatment. Bars are means +/- standard deviation.

**Figure 3.** Garlic heads by size class for the three treatments. Bars are means +/- standard deviation.