Cover Crops for the Home Garden

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What is a cover crop?

**Wikipedia**

“any plant grown to improve any number of conditions associated with agriculture”

**The Ohio State University**

“a crop grown to benefit the soil and other crops but not intended for harvest”
Why use cover crops?

Gardening is HARD on soil!

- Season-long traffic causes compaction
- Frequent tillage destroys structure
- Residue removal reduces:
  - available nutrients
  - organic matter
  - biological activity
Compaction

Source: The Ohio State University
Physical arrangement and pore distribution

Small spaces between soil particles

Larger spaces between soil crumbs
Soil organisms are involved in nearly every aspect of soil quality.
Cover Crops

Protect the soil when no crops are present
Root action improves soil physical properties
  • break-up compaction
  • “biopores”
Stimulate biological
  • activity
  • diversity and abundance
Decomposition improves aggregation
May add organic matter
Which cover crops are best for home or community gardens?

Many options available and used on a larger scale, both organically and conventionally. May not be appropriate for the home garden.

Our short list developed for ease of use:

- Will winterkill
- Aboveground growth (biomass) manageable
- Minimal pest/disease interactions
Cover crops for the home garden

Forage radish

- cool season annual
- broadleaf
- large taproot
- edible
Cover crops for the home garden

Berseem clover

- cool season annual
- broadleaf
- legume
- taproot
Cover crops for the home garden

Soybean

- warm season annual
- broadleaf
- legume
- taproot
- edible
Cover crops for the home garden

Buckwheat

- warm season annual
- broadleaf
- fibrous root system
- very rapid growth
Cover crops for the home garden

Oats
• cool season annual
• grass
• fibrous roots
• cheap!
Selecting which cover crop to use

All options will provide soil cover
Selection based on answers to the following:

When are you planting?
   Warm or cool season

Do you need to replenish nitrogen?

Is your soil tight or compacted?
## Cover crops for the home garden

Match species with planting niche and goals

### Cover crop selection matrix

<table>
<thead>
<tr>
<th>Planting time</th>
<th>Goal</th>
<th>Best option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm-season</td>
<td>Smother weeds, loosen tight soil</td>
<td>Buckwheat</td>
</tr>
<tr>
<td></td>
<td>Fix nitrogen</td>
<td>Soybean</td>
</tr>
<tr>
<td>Cool-season</td>
<td>Loosen tight soil</td>
<td>Oats</td>
</tr>
<tr>
<td></td>
<td>Alieve deep compaction</td>
<td>Radish</td>
</tr>
<tr>
<td></td>
<td>Fix nitrogen</td>
<td>Berseem clover</td>
</tr>
</tbody>
</table>
Mixes and seed sources

Mixes can combine benefits
Reduce risk of failure should conditions favor one over another

Common mixes:
- Oats + berseem clover
- Oats + radish
Mixes and seed sources
Mixes and seed sources

Seed available from many sources:

• Garden centers
• Catalogs
• Farm supply centers

Internet search: Cover crop seed suppliers

Many sources will sell by the pound

Inoculate legume seed
Planting and management

Minimize soil preparation
- Using cover crops to build soil
- Excessive preparation may offset benefit

Goal: Insure good soil-seed contact

Soil preparation may not be necessary
- Soil cracks, plant residue
Planting and management

Recommended procedure
Rake soil smooth removing significant residue
Broadcast seed*
Rake again, burying to appropriate depth
Mixes with different planting depths:
  Sow deeper-seeded cover first, rake in
  Sow shallow-seeded cover second, rake in
Water if necessary but Don’t crust soil!
## Planting and management

<table>
<thead>
<tr>
<th>Cover crop</th>
<th>Per 1,000 square feet</th>
<th>Planting depth (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pounds</td>
<td>Ounces</td>
</tr>
<tr>
<td>Buckwheat</td>
<td>1.2</td>
<td>19.2</td>
</tr>
<tr>
<td>Soybeans</td>
<td>1.7</td>
<td>27.2</td>
</tr>
<tr>
<td>Oats</td>
<td>2.1</td>
<td>33.6</td>
</tr>
<tr>
<td>Berseem clover</td>
<td>0.3</td>
<td>4.8</td>
</tr>
<tr>
<td>Oilseed radish</td>
<td>0.2</td>
<td>3.2</td>
</tr>
</tbody>
</table>

*Values rounded for ease of measurement. Weights will vary with different seed sizes. These rates should provide good stands with normal seed sizes.
Planting and management

Use a carrier for finer seeded species

Examples:
  Ground corn cobs, fertilizer
  Mix frequently

Double spread at one-half rate
  Divide seed lot in half to judge rate

Inoculate legume seed
Planting and management

Residue management

Recommended species will winterkill but:
Can produce appreciable amount of residue

Evaluate your ability to manage residue before planting

- Frequent mowing prevents unmanageable residue
- Some residue will decompose over-winter
Using cover crops

**Strategies:**

- Plant after harvest of summer crops
- Plant before summer crops
- Interplant

Plant in succession

- Soil building
- Reduce weed pressure
Start small and experiment

Gain experience with simple practices

See how covers respond to your unique conditions and management

Look for opportunities to exploit their behavior to solve specific problems
Cover Crops for the Home Garden

UWEX Publication A3933-02
Manure

Nutrients

Use

Precautions
### Typical total nutrient content of manures tested in Wisconsin (1998-2012)

<table>
<thead>
<tr>
<th>Solid Manure</th>
<th>DM %</th>
<th>N %</th>
<th>P₂O₅ %</th>
<th>K₂O %</th>
<th>S %</th>
<th>N lb/ ton</th>
<th>P₂O₅ lb/ ton</th>
<th>K₂O lb/ ton</th>
<th>S lb/ ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef</td>
<td>29</td>
<td>0.7</td>
<td>0.4</td>
<td>0.6</td>
<td>0.1</td>
<td>13</td>
<td>8</td>
<td>12</td>
<td>1.9</td>
</tr>
<tr>
<td>Dairy</td>
<td>33</td>
<td>0.5</td>
<td>0.2</td>
<td>0.4</td>
<td>0.1</td>
<td>9</td>
<td>4</td>
<td>7</td>
<td>1.2</td>
</tr>
<tr>
<td>Goat</td>
<td>43</td>
<td>0.7</td>
<td>0.4</td>
<td>0.5</td>
<td>0.1</td>
<td>13</td>
<td>7</td>
<td>10</td>
<td>2.0</td>
</tr>
<tr>
<td>Horse</td>
<td>33</td>
<td>0.5</td>
<td>0.3</td>
<td>0.4</td>
<td>0.1</td>
<td>10</td>
<td>6</td>
<td>8</td>
<td>1.3</td>
</tr>
<tr>
<td>Chicken</td>
<td>57</td>
<td>2.5</td>
<td>2.2</td>
<td>1.7</td>
<td>0.2</td>
<td>49</td>
<td>44</td>
<td>33</td>
<td>3.0</td>
</tr>
<tr>
<td>Sheep</td>
<td>34</td>
<td>1.0</td>
<td>0.5</td>
<td>1.2</td>
<td>0.1</td>
<td>19</td>
<td>9</td>
<td>24</td>
<td>2.2</td>
</tr>
<tr>
<td>Swine</td>
<td>19</td>
<td>0.9</td>
<td>0.7</td>
<td>0.5</td>
<td>0.1</td>
<td>18</td>
<td>13</td>
<td>10</td>
<td>2.0</td>
</tr>
</tbody>
</table>

*Source: UW-Extension Publication A2809*
Suggested rates of fresh manure or compost:
0.2 pounds of nitrogen per 100 square feet

<table>
<thead>
<tr>
<th>Manure type</th>
<th>Pounds to apply per 100 square feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy cow</td>
<td></td>
</tr>
<tr>
<td>no bedding</td>
<td>75</td>
</tr>
<tr>
<td>with bedding</td>
<td>90</td>
</tr>
<tr>
<td>composted</td>
<td>200</td>
</tr>
<tr>
<td>Sheep</td>
<td></td>
</tr>
<tr>
<td>no bedding</td>
<td>40</td>
</tr>
<tr>
<td>with bedding</td>
<td>50</td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Poultry</td>
<td></td>
</tr>
<tr>
<td>no litter</td>
<td>30</td>
</tr>
<tr>
<td>with bedding</td>
<td>70</td>
</tr>
<tr>
<td>Horse</td>
<td>with bedding</td>
</tr>
<tr>
<td></td>
<td>65</td>
</tr>
</tbody>
</table>

*Source: Wisconsin Master Gardener Program*
Manure Fun Facts

First year availability (N, P, K): 25, 80, 80%
Bedding dilutes nutrients
Manure contains S, micronutrients
Composting:
• Reduces moisture
• Reduces N
• Concentrates salts
Horse manure has highest weed seed potential
Handling and Safety

Fresh manure should be incorporated ASAP, in the fall

USDA NOP: 180/ 90 days before harvest
- Composted manure can be applied in-season

Hog manure should not be used

Antibiotics?