3.2.10. Cover crops for annual crops.

3.2.10.1. Description.

In the context of annual crops, cover crops are close-growing crops that provide soil protection, seeding protection and soil improvement between periods of normal crop production (Blanco and Lal, 2008). Cover cropping is an ancient practice (Worthen, 1948) whose purpose has changed with time, from animal fodder and green manure to their current use. Nowadays, is mostly a companion practice to conservation agriculture and agroforestry to protect soil erosion, and improving soil and water quality.

When approaching the use of cover crops as BMP in annual crops we need to be aware of three major concepts.

1- There are several strategies to implement this technique which are summarized in section 3.2.10.1.

2- Their effectiveness depends on the ability of farmers to implement a well established cover crops and the strategy taken, see also Table 3.2.10.1.

3- The specific techniques and species to be used need to be adapted to the objectives and specific crop, climate and soil conditions.

3.2.10.2. Types of cover crops according to their extension and location within the crop rotation.

a) Cover crops integrated as part of the rotation. These are crops grown in the whole field as part of the rotation between cash crops to improve soil quality and protect against erosion. They are usually legumes, a mixture of legumes and grasses, species with a deep rooting system to alleviate soil compaction, or others with biofumigation properties such as Sinapis. Examples of these cover crops are rye, clover, or vetch.

b) Strip cropping. Is the practice of growing crops in alternate strips of row crops or forage/grass. Strip cropping is usually integrated in rotations where strips are planted to a different crop each year. If properly managed they can be a very effective way of reducing erosion if implemented perpendicular to the slope.

There are other alternatives for intercropping that are more related to agroforestry principles of diversifying crops production and synergies among crops more than to soil and water conservation BMP, like intercropping, or relay cropping and are not going to be dealt with in this analysis.

Table 3.2.10.1. summarizes the major positive impacts of cover crops in field crops according to the type of cover crop.
### Table 3.2.10.1. Appraisal of cover crop impact according to type of cover crop

++ means high impact, + moderate impact, leg means legume cover crop. Adapted from Blanco and Lal (2008).

<table>
<thead>
<tr>
<th>Potential Benefit</th>
<th>Cover crop in the rotation</th>
<th>Strip cropping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erosion control</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Improving soil properties</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Enhancing soil fertility</td>
<td>+ (leg)</td>
<td>+ (leg)</td>
</tr>
<tr>
<td>Supressing weeds</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Increasing soil organic matter</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Recycling nutrients</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Preventing leaching of nutrients</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Improving water quality</td>
<td>+</td>
<td>++</td>
</tr>
</tbody>
</table>
3.2.10.3. Images of different kind cover crops in field crops.

Figure 3.2.10.1. Corn intercropped with wheat in Slovenia (Photo T. Dostal).

3.2.10.2. Strip cropping in the Czech Republic (Photo J. Krasa).
3.2.10.3. Strip cropping in Austria (Photo P. Strauss).

3.2.10.4. Selected References.


WOCAT 2017. Root-oriented cover crops (Italia) Available at: https://qcat.wocat.net/es/wocat/technologies/view/technologies_1291/
Note that in WOCAT database there are several examples of cover crops.


Return to Table 3.1.1.