# Cover crops

Cover crops are crops cultivated in between two succeeding main crops or together (under seeding) with a main crop. Cover crops can improve soil quality by increasing organic matter levels through the input of cover crop biomass over time. Also, cover crops can help to reduce soil compaction, improve soil structure and protect the soil from wind or water erosion.
The cultivation of cover crops serves various objectives. Most important is to reduce evaporation of soil moisture during the dry days – not only in summer. Every cover crop contributes to the reduction of GHG emission, because it contributes to the available nutrients by storing the nutrients in the organic matter and N-fixation, if legumes are part of the cover crop mix.

### Green Cover Crops and Intercropping

Green covers can be cultivated as cold and warm season green cover crops or in combination with a cash crop so called intercropping.

**Cold Season Green Cover Crops**
Green cover should be used for summer seeds like cotton and melones during the winter period. They will cover the soil and accumulate moisture, which will be available for the following crops. Sowing will be either in June after the winter annual or after a summer crop in late autumn.

**Warm Season Green Cover Crops**
Green cover can be implemented before a winter annual crop during the summer from June until October. The restricting factor is the water availability especially in the summer season. The green cover will need irrigation during this time, to provide adequate cover and biomass production.

**Intercropping with cash crops or fodder crops**
The combination of cash crops (e.g., cotton or corn with mung bean) with green cover crops including legumes is a common practice. Water availability is necessary before going into big scale on large areas. The intercrop must match specific requirements. The cover crop should not compete too much with the main crop. It should preferable be a legume to provide additional N-nutrient to the main crop and it should not go into seeding unless it can be controlled easy later on.

The following green cover mix of seeds have been used for the Kurdamir pilot sites. The mix of green cover crop was chosen due to their availability in Azerbaijan and the estimated feasibility for good growth under the specific conditions of the Kurdamir pilot sites.

### Type of Green Cover Mix and plants used

| Plants used in Green cover | Type of Green Cover Mix | | | |
|---|---|---|---|---|
| | Mix-Winter 1 kg/ha | Mix-Winter 2 kg/ha | Mix-Winter 3 kg/ha | Mix-Winter 4 kg/ha |
| Rye | 0 | 38 | 76 | 70 |
| Alfalfa (Blue Moon) | 0 | 0 | 5 | 8 |
| Italien Rye Gras | 6 | 3 | 3 | 3 |
| Turnip | 5 | 4 | 4 | 3 |
| Rape seed | 3,5 | 4 | 4 | 9 |
| Common Vech | 8 | 9 | 8 | 7 |
| Persian Clover | 2,5 | 2 | 0 | 0 |
| Total (seed kg/ha) | 25 | 60 | 100 | 100 |

### Biomass measurement

In order to identify the productivity of green crops the biomass measurement was conducted in the pilot sites in April 2022. According to the results of biomass measurement the “Mix-Winter 03” had the highest productivity.

### Biomass measurements in green cover plots

| Measurement № | Weight, kg/m² | Green cover mix № |
|---|---|---|
| 1 | 1.4 | 1 |
| 2 | 2.9 | 1 |
| 3 | 2.7 | 2 |
| 4 | 4.6 | 3 |
| 5 | 1.9 | 3 |
| 6 | 1.6 | 4 |
| 7 | 1 | 4 |
| 8 | 2.7 | 2 |
| 9 | 2 | 1 |
| 10 | 1.7 | 1 |

### Green cover in Kurdamir pilot site

1 – green cover mix seeds, October 2020 | 2 -green cover field, December 2020 | 3 - green cover field, May 2021

Cultivation and proper management of green cover plants was a new approach in the pilot area. For this reason, appropriate machinery and equipment, including knowledge and skills, was limited. It was decided to purchase equipment to chop the green cover plants planted in the autumn of 2020 and mix them with the soil.
All biomass in pilot sites was chopped by chopper machine, ripper and disk harrow were applied for seedbed preparation.

### Challenges and Learned lesson

- The availability of seeds adopted to the local climate and soil properties is limited – at least in a commercial sense and with sufficient amounts.
- Different types of technologies and practices need to be applied and evaluated according to the local condition
- Cover crops should be chopped and mixed in the soil in early spring depending on growth of the cover crops

**Reference**
The poster was developed based on “Farm Management Plan of ECOserve pilot sites” elaborated by Thomas Wehinger, Samir Abbasov and Nizami Ibrahimli

### Steps of chopping of green cover and mixing in the soil

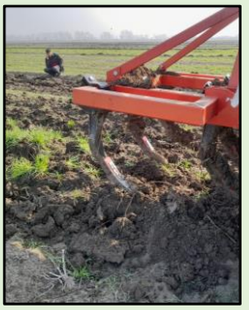
1- Implementing disk harrow

2- Chopping of green mass by chopper machine

3 - Mixing the chopped biomass by rotavator

1- Cut green cover by disk harrow

2-Chopped biomass by chopper machine



3 – Seed bed preparation

Photos© Samir Abbasov, GIZ

**Preparad by**
Samir Abbasov, GİZ ECOserve Advisor
Sevinj Sarukhanova, GİZ ECOserve Advisor

Environment, Climate, Opportunities for people and nature