

Cauliflower and leeks to have company in the field

Organic vegetables may benefit from the growing of living mulch crops between crop rows. Scientists from four EU countries are looking for potential positive effects.

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Organic leeks and cauliflower will be accompanied by other plants between the crop rows in a new research project at Aarhus University. The project will examine if the growing of so-called living mulch plants between the rows can improve the growth and quality of the vegetables and also reduce the environmental impact from the organic farming systems.

Living mulch crops growing between rows of cash crops are not a common sight in vegetable production, but may have a use in organic farming. It can be a useful tool for managing soil nutrients, pests, weeds and diseases which may reduce energy consumption in the production.

Four EU countries – Denmark, Slovenia, Germany and Italy – are involved in the new project. Scientists from each country will grow two crops and combine them with different types of living mulch crops under their different cultivation, climate and soil conditions. The aim is to examine what effect the use of living mulch has on the growth, quality and environment of the vegetable cash crops.

In the project the choice fell on organic cauliflower and leeks.

- We chose to grow two crops that are both challenging in their own way but are also important crops for the consumer. Cauliflower is difficult to grow in an organic system because it is easily attacked by disease and by insects and because any nutrient shortage will affect the quality at harvest. Leeks are an environmental challenge because they have a shallow root system with a large demand for and a low uptake of nitrogen fertiliser, and because it is harvested in the autumn where it is too late to grow a catch crop to mop up the residual nitrogen. When you grow leeks you can therefore easily lose a lot of nitrogen to the environment, says associate professor Hanne L. Kristensen from Aarhus University.

When choosing living mulch and farming methods it is important to identify the ones that do not compete too much with the cash crop and that can have beneficial effects.

- For the cauliflower we will use an overwintering green manure of clover and grass that can be rotovated in strips where the cauliflower is planted in the spring. Between the rows of leek we will use a catch crop such as dyers woad as it has deep roots that can take up the nutrients under the leeks, says Hanne L. Kristensen. The competition between the cash crop and the living mulch is controlled either by restricting the root growth or by delaying the sowing of the living mulch.

Results from the living mulch experiment will be compared with the normal cultivation of organic cauliflower and leek crops. Also examined will be the importance of the different growth properties of the crop varieties,

the fertilisation level and different combinations of weeding/no weeding on crop growth, product quality and nutrient loss. With the results on weed, pest and disease infestations in the plots this will improve the understanding of biological interactions in agroecosystems.

Next year the scientists will test the systems and collect insects at commercial growers, partly to upscale the experiments and partly to communicate and demonstrate the concept that is based on the principle of eco-functional intensification.

- The optimal situation with living mulch is that it attracts beneficial insects, reduces nitrogen leaching, outcompetes weeds and gives a better utilisation of nutrients and a higher biodiversity in the field. Whether this will hold true we will probably get an indication of in the summer, says Hanne L. Kristensen.

The three-year project INTERVEG is a joint effort between Aarhus University and research institutions in Italy, Slovenia and Germany and the project is supported by national funds via the ERA-NET [CORE Organic II](#).

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