PRACTICE ABSTRACT

Diversified rotations in protected vegetable production systems

Problem

In protected vegetable systems of the Mediterranean area, rotations are based on a limited number of species and botanical families. In the long term, this favours the development of soil pests and diseases.

Solution

In order to diversify rotations, a workshop brought together DiverIMPACTS case study 25 (CS25) participants including farmers, technicians, marketers and scientists, to highlight the importance of:

- including summer crops of variable cycle length in order to allow the implementation of soil solarisation (thermal soil disinfection based on solar energy)
- including green manures at different times of the year
- choosing species that allow cycle shifts to desynchronize pest cycles but also that take advantage of market opportunities.

Applicability box

Theme
Rotation, learning, cropping system

Agronomic conditions
Mediterranean area. The workshop took place in a vegetable production area in the South of France. The principles outlined here can be taken up and adapted to other contexts

Application time
Duration of the rotation

Required time
Duration of the rotation

Period of impact
Duration of the rotation

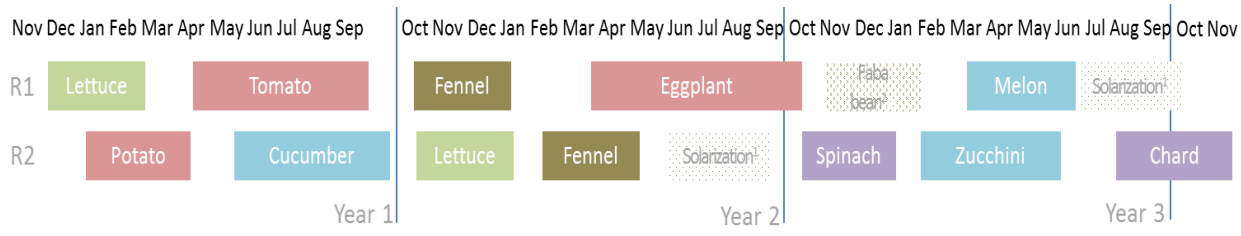
Equipment
High (walk-in) plastic tunnels

Best in
Middle-sized farms targeting (at least partly) long supply chains

Benefits

By relying on these principles, it is possible to design rotations that are more favourable to the preservation of soil health while taking into account the organisational constraints of a farm and economic opportunities.

Practical recommendation



Legend:
Crops labelled with the same color belong to the same botanical family.
[1] Soil solarization is a non-chemical pest control method using solar power to increase the soil temperature to levels at which many soil-borne plant pests are killed or greatly weakened.
[2] Faba bean is used as a green manure.

Figure 1: Two examples of diversified rotations designed by DiverIMPACTS CS25's actors for high plastic tunnels or multichapel greenhouses of middle-sized farms targeting at least partly organic long supply chains.

- Rotation 1 (R1) is based on flagship summer vegetables of the region where CS25 is located (figure 1). In addition to tomato and eggplant, melon makes it possible to insert a second botanical family and a short crop cycle favourable to the implementation of solarisation. Winter crops are chosen to avoid time-

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consuming crops and long periods of bare soil. They are also consistent with the commercial demand of the supply chains located in the region. Soil solarisation is needed to control soil-borne plant pests since recommended intervals before the return of the same crop or botanical family are only partly respected (e.g. solanaceous crops such as tomato and eggplant should return only every four years).

- Rotation 2 (R2) recommends time slots that allow a move away from the classic alternation between summer crops and winter crops (Figure 1). This makes it possible to take advantage of different commercial opportunities whilst also desynchronising pest and disease cycles. Potatoes and zucchinis are thus positioned as spring crops and can benefit from premium prices. Solarisation is needed since cucurbit (cucumber, zucchini) and chenopodiaceous crops return every two years instead of four.

Further information

Further readings

- Produire des légumes biologiques. Tome 2: Spécificités par légumes. Rey F., et al. 2017, ITAB, 420 p.

About this practice abstract and DiverIMPACTS

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DiverIMPACTS: The project is running from June 2017 to May 2022. The overall goal of DiverIMPACTS - Diversification through Rotation, Intercropping, Multiple Cropping, Promoted with Actors and value-Chains towards Sustainability - is to achieve the full potential of diversification of cropping systems for improved productivity, delivery of ecosystem services and resource-efficient and sustainable value chains.

Project website: www.diverimpacts.net

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