



Naturland

Clovergrass mixture sown into strawberries and raspberries

Intermediate results from the EUKI project



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Researchers from InHort institute in Poland, partner in the EUKI project (*Improving C-balances on organic farms for the sequestration of atmospheric carbon*) carried out a trial with clovergrass sown into strawberries and raspberries. The purpose was to enrich organic matter and improve soil structure, increase nutrient reserves, improve organic carbon dynamics, increase nitrogen resources, stimulate biological activity in the soil, inhibit weed growth, and create a habitat for natural enemies of harmful organisms.



Figure 1: Strawberry plant with undersown clover



Figure 2: Young raspberry plants with interrow clover

Practical recommendation – Benefits and challenges of interrow cover crops with clover:

Raspberries	
<ul style="list-style-type: none"> + higher yields per plant + visually better growth conditions of raspberry plants + lower weed pressure between rows + increased insect occurrence 	<ul style="list-style-type: none"> - control of clover within the row
Strawberries	
<ul style="list-style-type: none"> + slightly higher yield per plant possible + lower weed pressure between rows + increased insect occurrence 	<ul style="list-style-type: none"> - control of clover within the row - higher percentage of damaged fruits (e.g. pest: snails, diseases: <i>Botrytis cinerea</i>)

Methodology

The experiment was started in May 2021 by planting Lycia strawberries and Poemat raspberries. A month later, cover crops were sown between the rows. The cover crop mixture consisted of white clover (*Trifolium repens*) and sheep fescue nano grass (*Festuca ovina*) at a dose of 10 g of mixture (7 g festuca + 3 g clover) per 1 m². The species were chosen because of being small in stature. On the strawberry plantation, clover was sown in every second row, and on the raspberry plantation, in every row. In order to ensure proper crop development, drip irrigation was installed on the plots and maintenance treatments were carried out in the form of mechanical weeding using an inter-row weeder and supplementary manual weeding.

After the cover crops had become established during the experiment, their growth was mechanically limited in the immediate vicinity of the crop rows (to reduce competition with the crops) using a row cultivator specially adapted for this purpose, and mowing was carried out 2-3 times (depending on the season), leaving the resulting mulch in the inter-rows.

Results

On plots (strawberries, raspberries) with clover in the inter-rows, there were no problems with weeds, but clover grew into the rows of cultivated plants, which would compete with the cultivated plants, so it was controlled several times in the immediate vicinity of the cultivated plants. The condition (growth, leaf colour) of raspberry plants was visually much better than control.

In plots with cover crops, there were definitely about 3-5 times more insects from the bee family: bumblebees (Bombini), bees (Apiformes) and twice as many hoverflies (Syrphidae) than in control plots, where, in turn, more butterflies were recorded. Pollinators were present on clover even after the flowering period of the crop.

The occurrence of diseases and pests was not very diverse. Only on the strawberry plots with clover a larger population of snails was recorded (resulting partly also on crop damage). In turn, on raspberries growing together with clover, a very high population of thrips was recorded, although no damage to the yield was noted (most likely these were species associated with legumes and not damaging to fruit plants).

A quantitative and qualitative analysis of the strawberry and raspberry harvest was carried out in 2022. The strawberry harvest was quantified as follows: marketable fruit regardless of size and damaged fruit (by weevil, snails, birds, sunburn, rot). In the plot where clover grew in the inter-row, the yield was 411 g/plant, and in the control plot, it was 262 g/plant. The highest percentage of damaged fruit was found on the plot with clover in the inter-rows (approx. 14%) and on the control plot (6.5%), but the commercial yield did not differ significantly from other combinations, though control had the lowest

commercial yield. The average weight of 100 fruits did not differ significantly in any of the experimental combinations.

The yield obtained in raspberry plots was assessed in a similar manner. The highest total yield was obtained on a plot with clover in the inter-rows, 1302 g/plant, while in the control it was 391 g/plant, but the quality of the yield did not differ significantly. Only 2-3% of the fruit on all plots qualified for first selection, with the remainder classified as Extra (standard according to Polish Norms).

Recommendations

For raspberries the method of sowing white clover or a mixture with a grass can be recommended. For strawberries there are some challenges to be considered. The positive aspects are higher yield and better plant conditions. The negative aspect is that the white clover is spreading into the strawberry rows which causes more manual labour for weeding. There is also the possibility of greater slug pressure and diseases. Therefore, in strawberries the producer has to decide – also depending on the duration of the plantation.

Authors: Malgorzata Tartarus, Jacek Nowak, Werner Vogt-Kaute
Project partners:



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