

SoildiverAgro project

Adoption of new management practices to increase crop production and quality



THE WHAT AND WHY

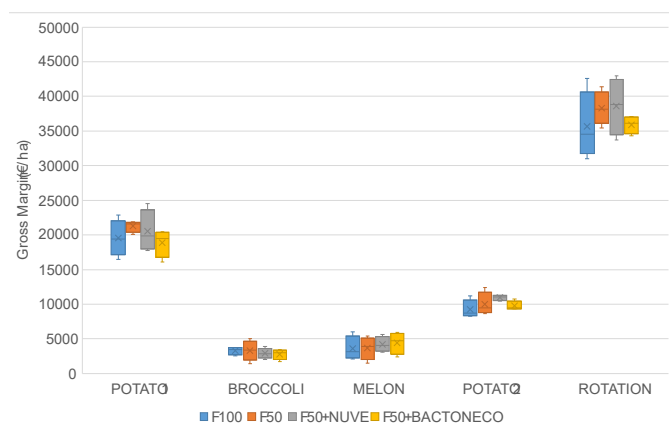
On-farmer economic evaluation of the reduction of inorganic fertilization and the application of biostimulants in a potato-based crop rotation

This study analyses the potential for improving profitability and sustainability in a typical SE Spain's potato-based crop rotation, through the reduction of inorganic fertilization and the application of plant growth promoting microorganisms. The considered crop rotation includes potato, broccoli, melon and potato cultivated sequentially along three years (2020-2023).

The experimental design comprises four treatments: the conventional fertilization control treatment (T1); a reduction of fertilization (T2); a reduction of fertilization combined with the application of plant growth-promoting bacteria and fungi (T3); and a reduction of fertilization combined with the application of plant growth-promoting bacteria (T4). Fertilization was reduced

by 30% in the first crop cycle planted with potato (2021) and by 50% in the three following crop cycles. The applied biofertilizers are BACTONECO™, a combination of nitrogen fixing and phosphorus and potassium solubilizing bacterial strains, and NUVE™, a mixture of bacteria and non-mycorrhizal, both produced by the Spanish firm Fyneco®.

Despite the high variability in the data, the results confirm that reducing the application of fertilizers is a sustainable farming strategy, as it does not reduce crop profitability for any of the crops in the rotation, and that the application of a mixture of bacteria and non-mycorrhizal has a positive effect on crop profitability from the second year onwards.



1. Box and Whiskers plot that shows the variability of the calculated gross margin for each experimental treatment and crop cycle (including the full crop rotation) based on the results obtained for each repetition (block) of each experimental treatment.

Experimental treatment	Revenue (€/ha)	Direct costs (€/ha)	Gross margin (€/ha)
T1: Control 100% Fertilization	67306	31.648	35658
T2: Reduced Fertilization	67168	28.880	38288
T3: Reduced Fertilization + NUVE™	68122	29.547	38575
T4: Reduced Fertilization + BACTONECO™	65436	29.535	35901

2. Average value of sales revenue, direct production costs and gross margin by experimental treatment for the whole crop rotation.

KEYWORDS

Economic profitability, gross margin, inorganic fertilizers, potato cropping, nutrient-solubilizing bacteria, mycorrhizal fungi

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