

PROTO PLUS AGRO BETTER MINERAL AVAILABILITY E.G. MAGNESIUM, NITROGEN, IRON



INTRODUCTION

Protists are a very interesting microbiome optimisation tool for agriculture. Since 2016 ECOstyle is working on ProtoPlus which is unique biostimulant based on protozoa. Protozoa are robust micro-organisms that are a great added value to your crop. Protozoa graze on particular bacteria and by that have a major impact on soil biodiversity. The actions of the protozoa in ProtoPlus are responsible for a broad microbial community in the soils rhizosphere. Keeping certain microbes from dominating the microbiome, for example protists can help establish biocontrol micro-organisms in the soil of the crop. This not only creates a vital and robust soil life, but also makes minerals available for plants in a way that can be easily taken up and distributed in the plants tissue.

ProtoPlus significantly improves the uptake of nutritional elements (amongst others particular Iron (Fe), and Magnesium (Mg)) in the crop. This ensures higher yields for your crop, also under stressful growing conditions. With the addition of ProtoPlus to the soil, the crop needs less energy to absorb these nutrients so more energy can be used to add biomass to the crop, for example more starch in potatoes.

APPLICATION

1l/ha. during plantation. Liquid application via spraying equipment on planter.

2 l/ha Spray together with other liquids, shortly before planting or shortly after planting.

ProtoPlus can be mixed in with herbicides and insecticides and with most fungicides and bactericides.

ACTIVE INGREDIENT

Cercomonas lenta ECO-P-01, Rosculus terrestris ECO-P-02 (ECOstyle protozoa): 10^8 CFUs per ha

ADDED VALUE PROTOPLUS AND FUTURE PERSPECTIVES

ProtoPlus is a driving factor for plant nutrition via grazing of protozoa on soil micro-organisms. This makes the ProtoPlus an ideal optimisation tool for a sustainable agriculture. Also, the grazing on soil micro-organisms could help establish biocontrol micro-organisms in a cultivation.

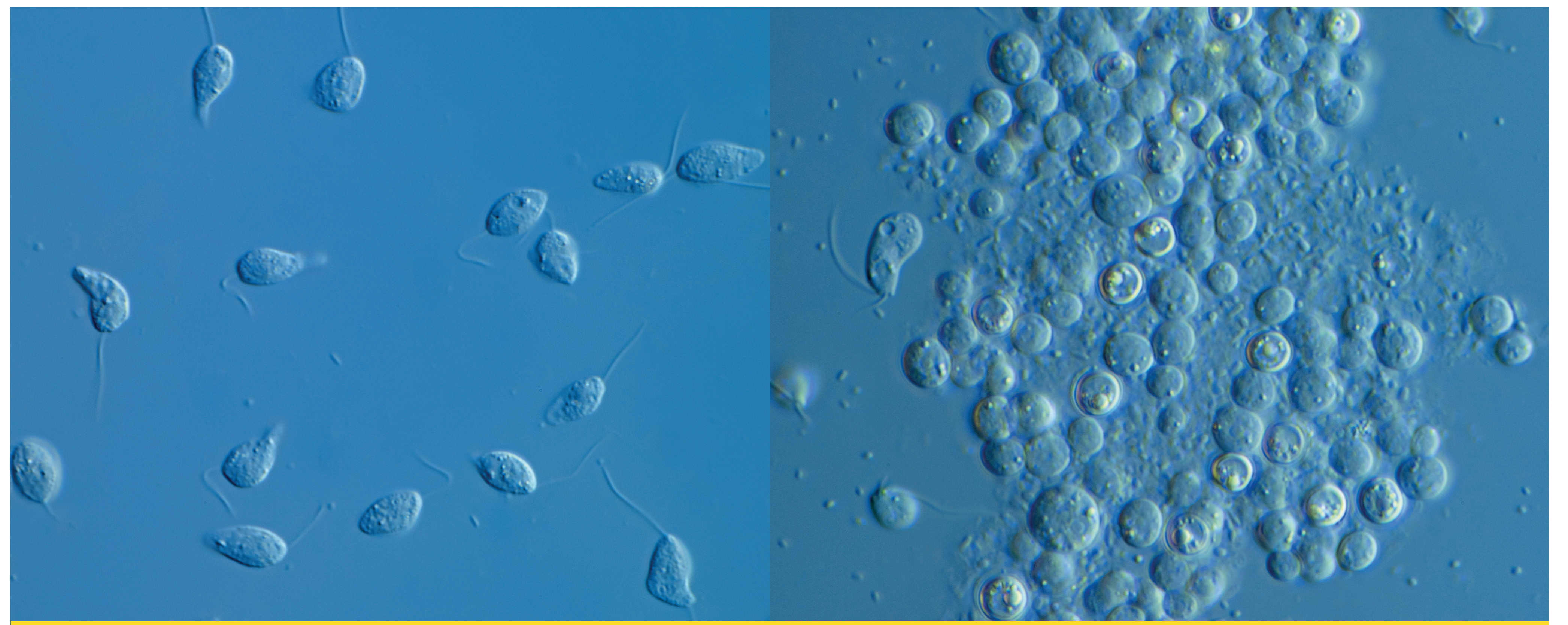


Figure 1: Cercomonas lenta (left picture), Rosculus terrestris (right picture).



Figure 2: Cercomonas lenta close up picture

WHY PROTOPLUS:

- SIGNIFICANT HIGHER YIELD AND QUALITY
- BETTER NUTRIENT UPTAKE -> MAGNESIUM, IRON, POTASSIUM, NITROGEN
- HIGHER TUBERIZATION
- HIGHER STARCH CONTENT IN POTATOES

PROTOPLUS IMPROVES CROP QUALITY AND YIELD, ALSO DRY MATTER CONTENT IMPROVES BECAUSE OF THE EXTRA NUTRITION FROM THE GRAZING PROTIST ON BACTERIA.

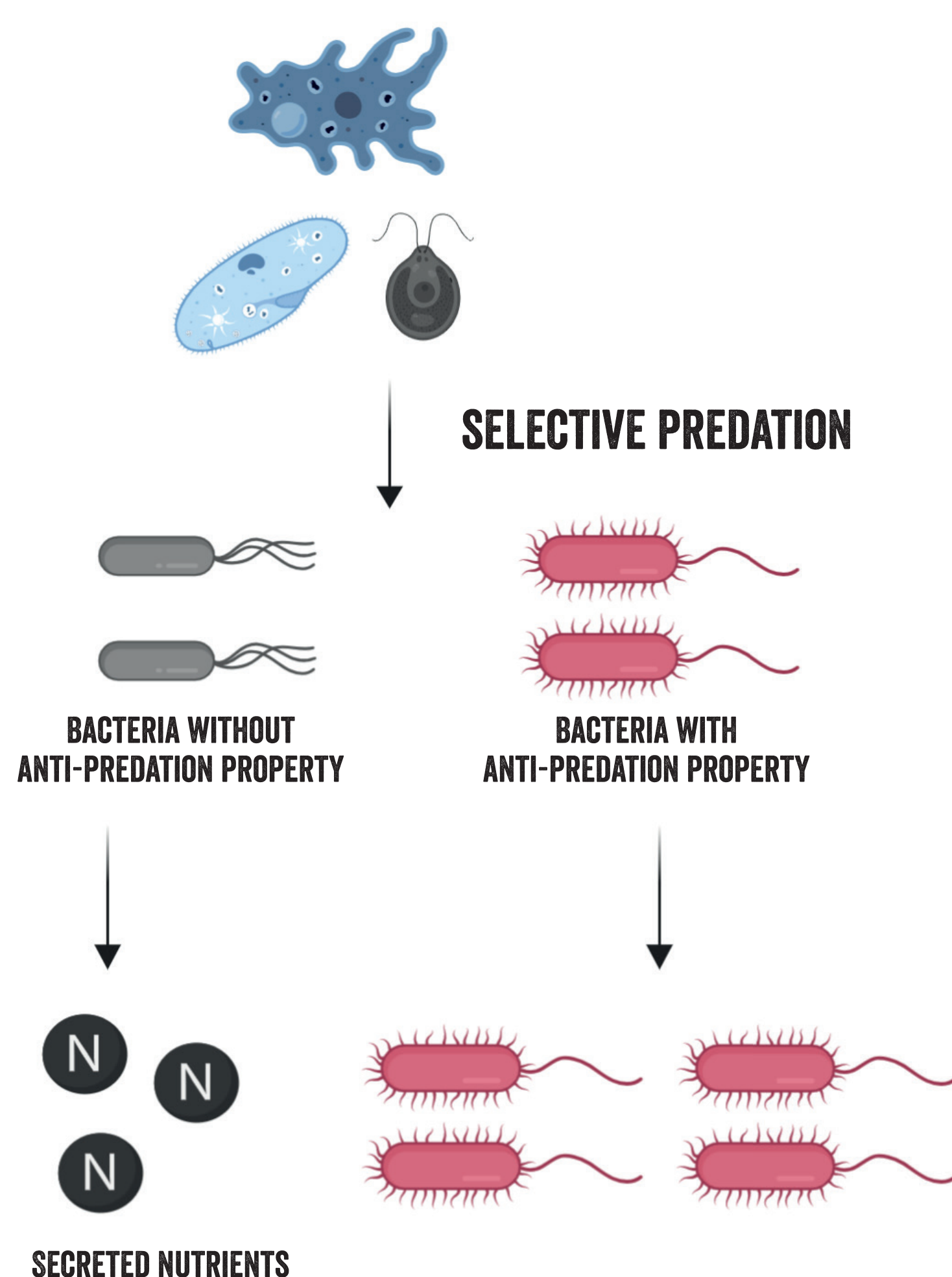


Figure 2: Impact of selective predation by protists on bacterial community. Bacteria that cannot express anti-predator strategies are consumed by protists and release nutrients. Conversely, bacteria that are able to express anti-predator strategies, for instance changing surface properties, increasing motility and release toxin, will gain a competitive advantage at the cost of sensitive bacterial populations. (Gao, 2020)

TRIAL RESULTS

Yield and Starch trials (graph 1 & 2):

Trial locations: Netherlands

Different soil type are tested: Clay soils and sandy soils

Crops: Potatoes

Application method: Application during planting

1 l per ha (10^8 CFUs per ha)

Dry matter content trials (graph 3):

Trial locations: Netherlands

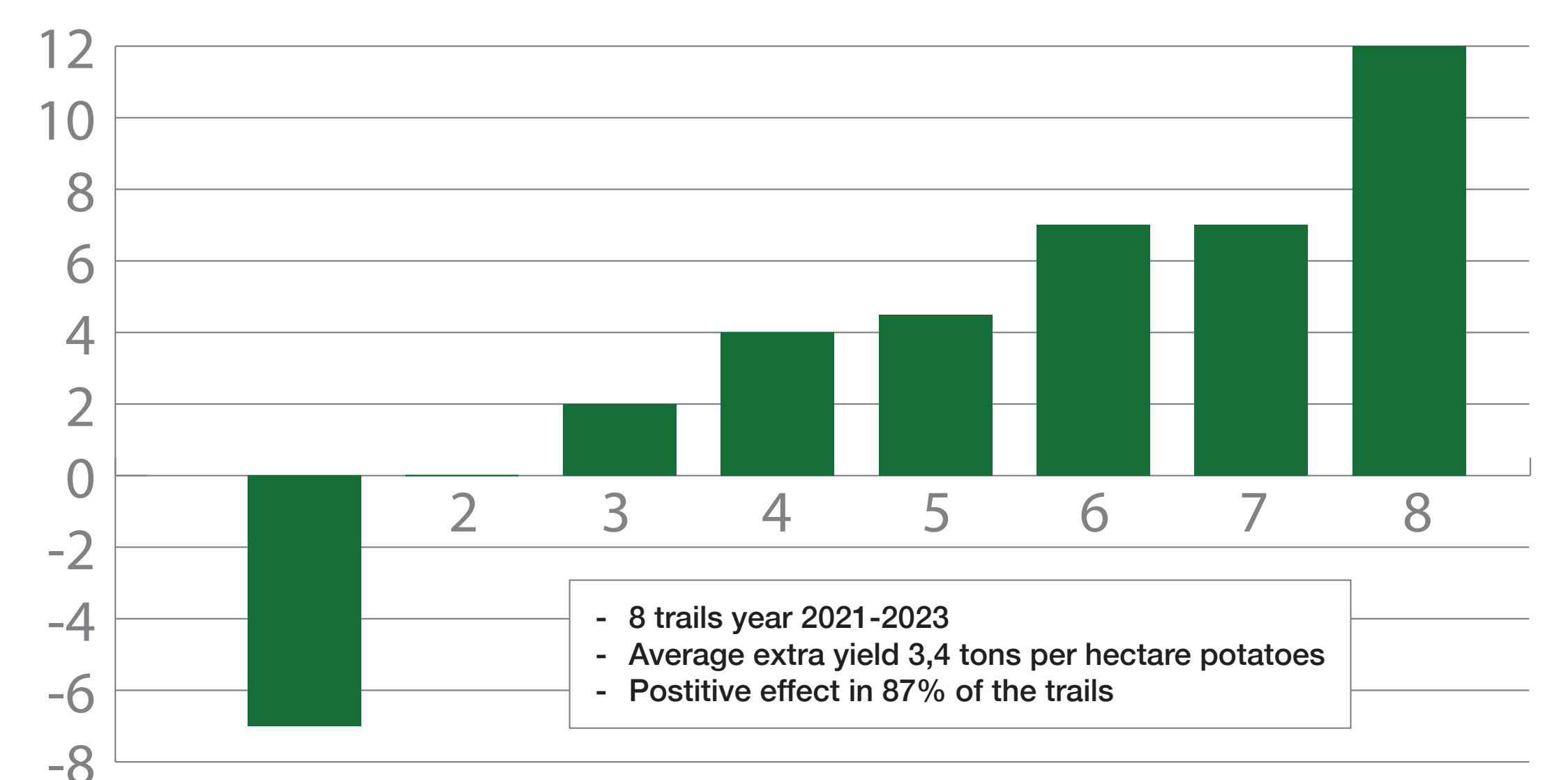
Different soil type are tested: Clay soils and sandy soils

Crops: Potatoes, spinach, leek and grass

Application method: Application during planting/sowing

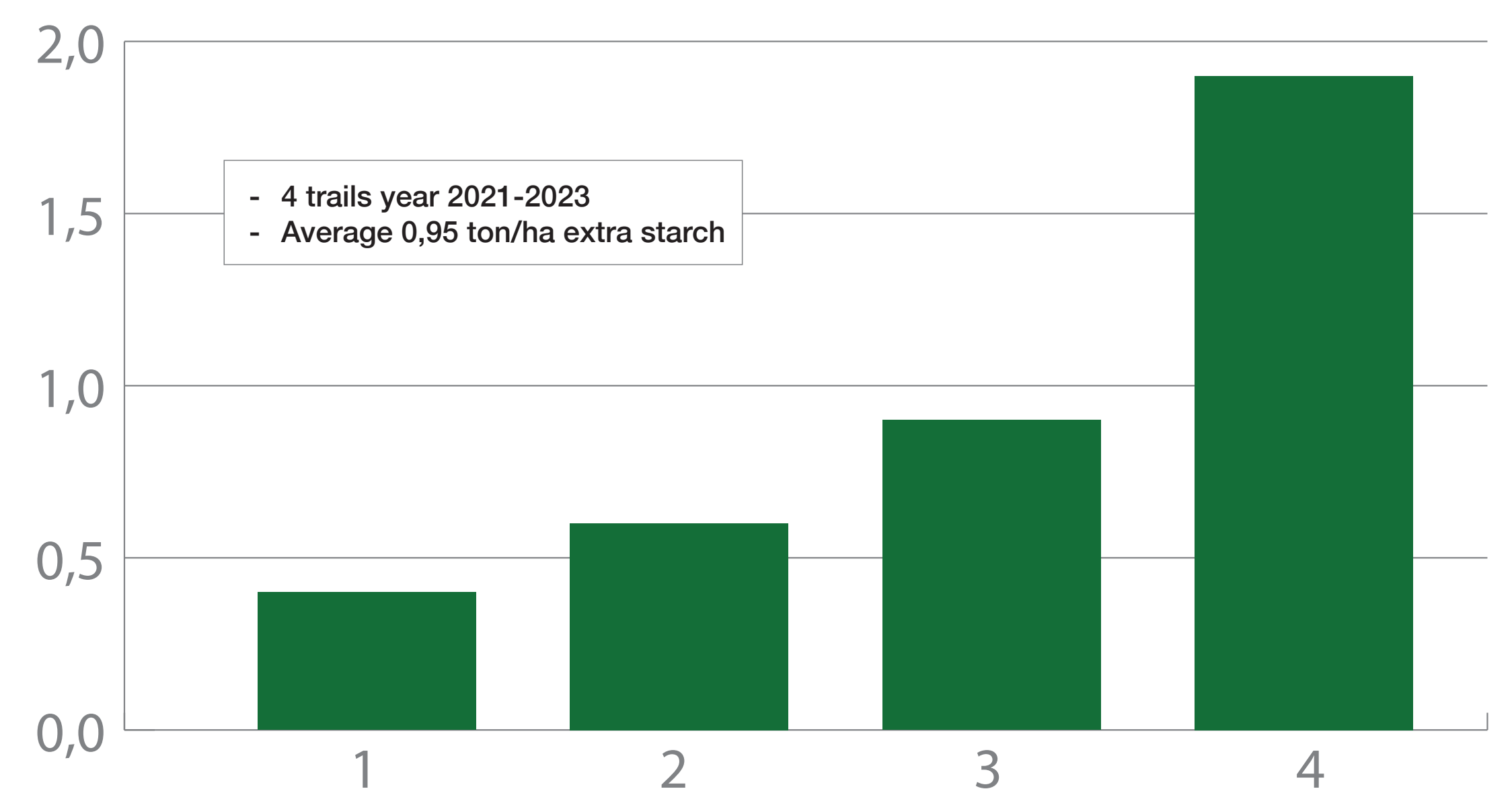
1 l per ha (10^8 CFUs per ha)

ADDITIONAL YIELD IN COMPARISON TO STANDARD TREATMENT (TONS PER HECTARE)



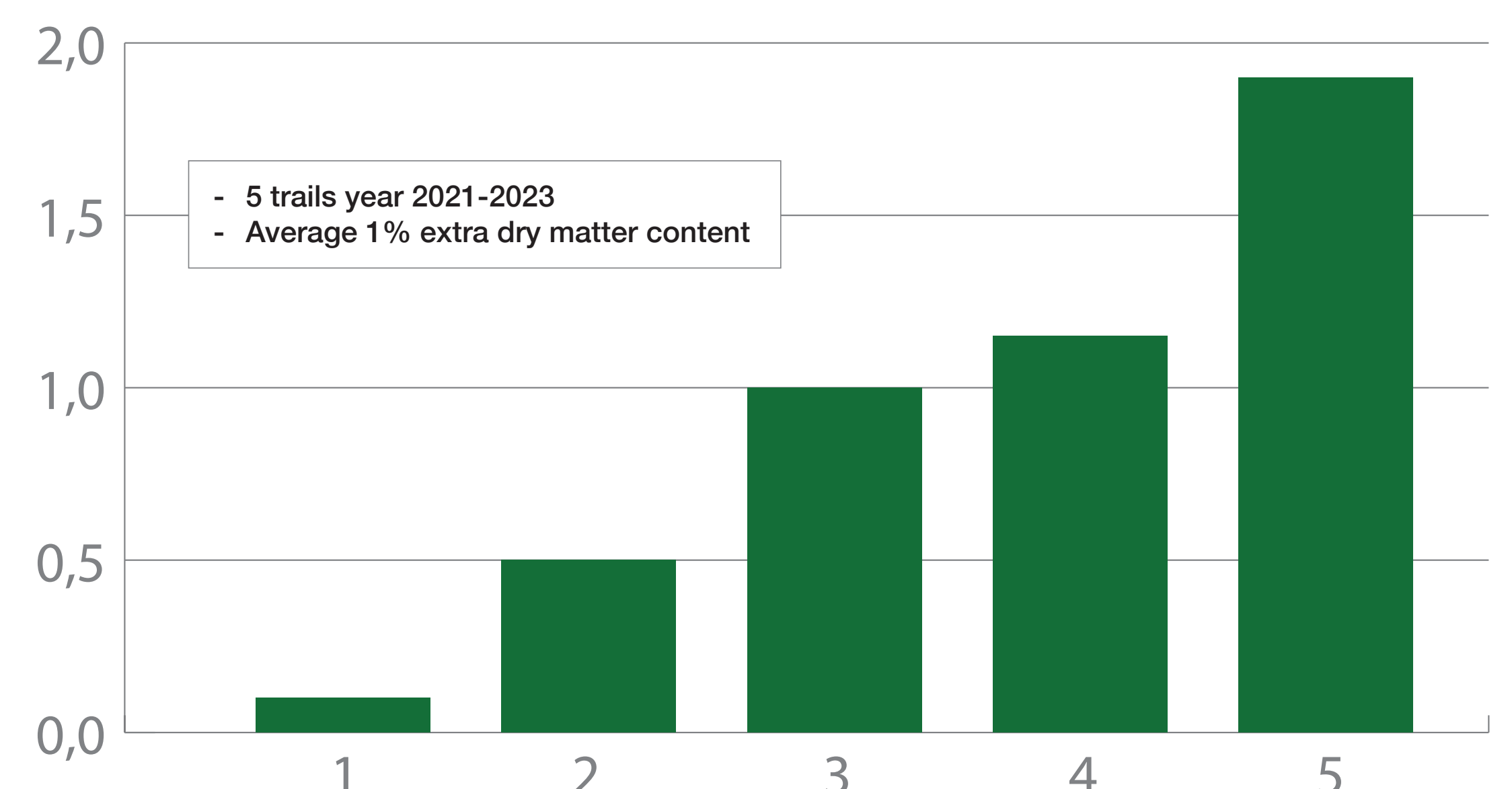
Graph 1: summary of 8 trials on potatoes

ADDITION STARCH CONTENT IN COMPARISON TO STANDARD TREATMENT



Graph 2: summary of 4 trials on potatoes

ADDITIONAL DRY MATTER CONTENT %



Graph 3: summary of 5 trials on potatoes, spinach, leek and grass