

EFFECTS OF SOIL BACTERIAL INOCULATION ON MAIZE AND SUNFLOWER ORGANIC MATTER AND CROP PRODUCT



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ABSTRACT

Area treated with Biofil Savanyú and Biofil Savanyú + Biofil S performed above control. Thus, considering the totality of chlorophyll measurements in the second place, Biofil Savanyú was performed, which produced high chlorophyll values in all measurements, so the nutrients were better in the area treated with this preparation compared to the control. The area treated with Biofil Savanyú + Biofil S produced significant chlorophyll fluctuations, from this it is concluded that certain components of the bacterial content of the two preparations are in competition with the plant population for water and nutrients as a function of improvement or deterioration of the water supply. For Bactofil A10 and Bactofil A10 + AlgaFix, chlorophyll values in the second half of the culture period were around or below the control plot values, Thus, chlorophyll accumulation was not significantly affected, and in some cases chlorophyll accumulation was even pushed back compared to the control plot, suggesting a less favorable rhizosphere and an adverse effect of nutrient competition. In the case of plots treated with Bactofil A10 alone, a small increase in the generative phase as a result of the improved water supply indicates that the bacteria after a suitable puppet or spore survived, they were reactivated and improved as a result of improved water supply and bacterial activity. The area treated with the combination of Biofil Savanyú + Biofil S formulations also produced a significant increase, although the same was true for the plot treated with Biofil S, Thus, knowing this, I declare that the response of the bacterial strains in Biofil S to soil dehydration and re-wetting is better, as for the strains in the Biofil Savanyú formulation.

The area treated with Biofil Savanyú + Biofil S, which produced the smallest yield, produced the best 1000 seed weight. In summary, bacterial inoculation can increase the average yield by 500-600 kg / ha. Bacteria improve soil nutrient supply with favorable soil moisture, which improves the yield parameters of plants.

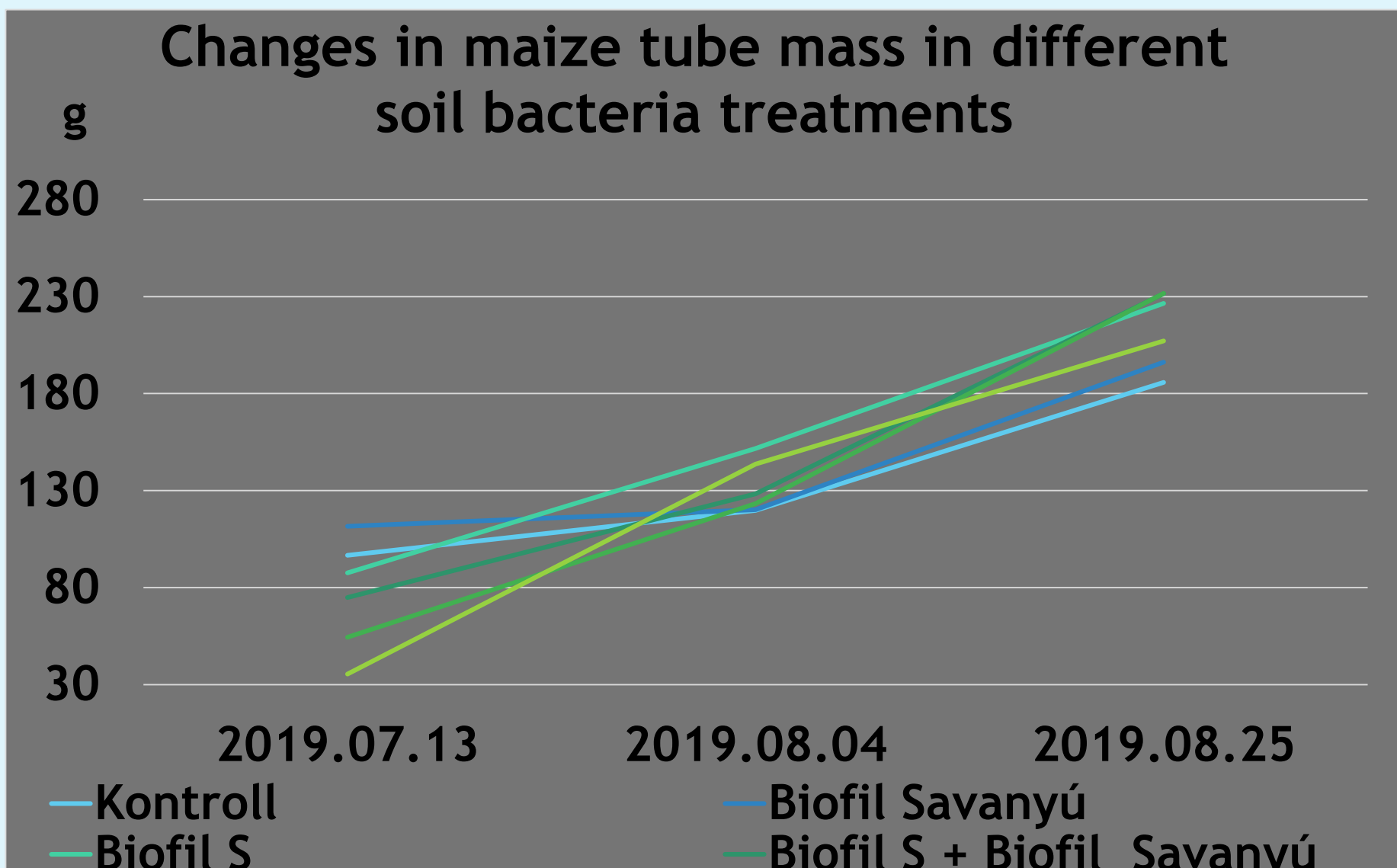


Figure 3: Changes in maize tube weight during the generative phase of the growing season

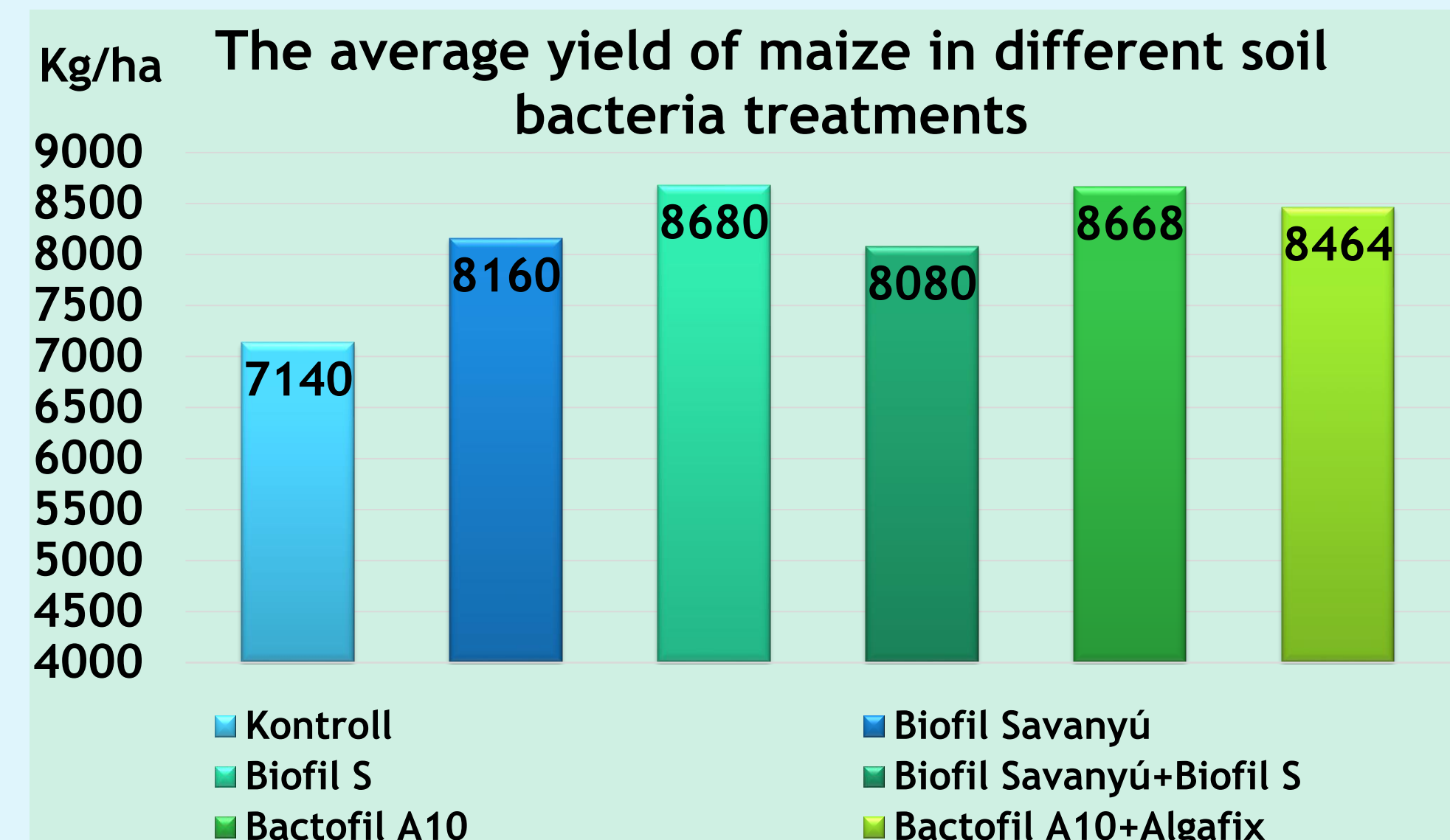


Figure 4: Yield results for each plot

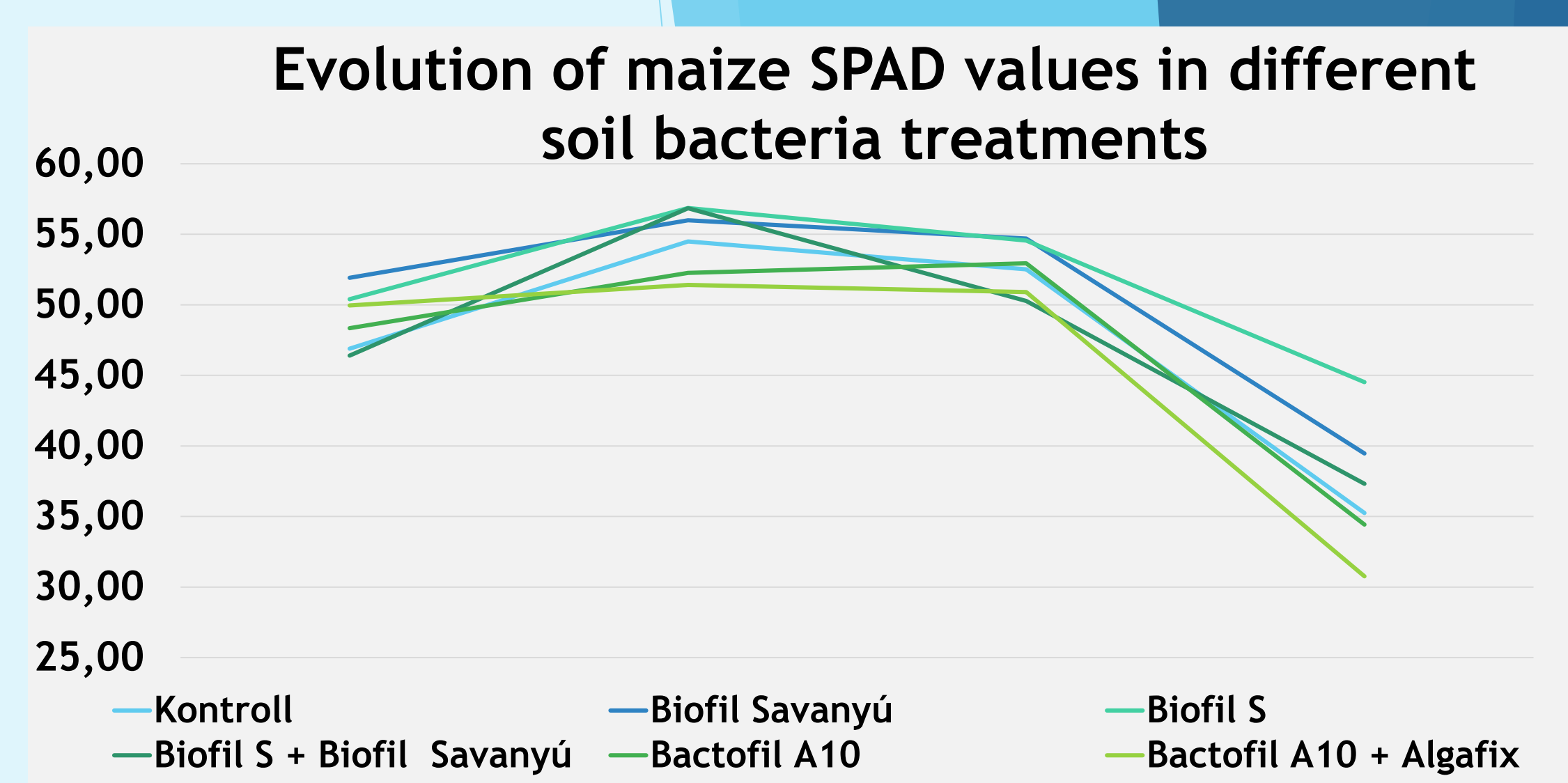


Figure 1: Development of SPAD values of maize during the growing season

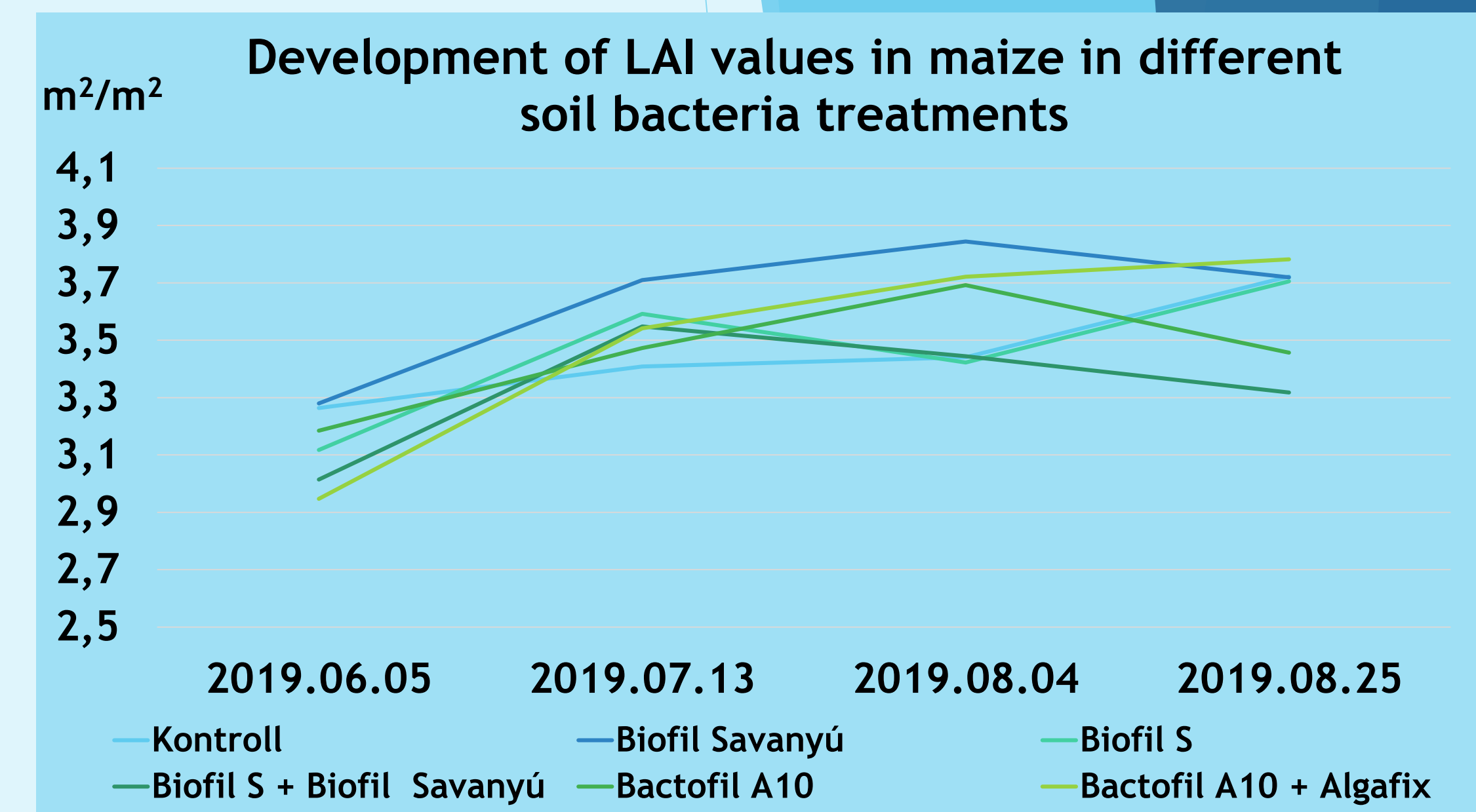


Figure 2: Development of the LAI value of maize during the growing season

RESULTS

Effect of bacterial inoculation on the relative chlorophyll content of maize

The favorable initial effect on the initial development of maize was exerted by Biofil Savanyú, thus, it can be concluded that it can have a positive effect on the intensity of the initial chlorophyll synthesis. Similarly high chlorophyll values (compared to the control) were given by plots treated with Biofil S. Initially, the combination of Biofil Savanyú and Biofil S resulted in a lower SPAD value compared to the control, which is likely to be the higher number of individuals present, which occurs due to competition for nutrients between the plant and the bacterial flora.

In the case of the plot treated with Bactofil A10 only, I experienced an important decrease in leaf area, which can be traced back to the fact that the bacterial treatment alone can only have a positive effect on chlorophyll synthesis and thus on leaf life, however, not an increase in leaf area towards the end of the growing season.

Effect of bacterial inoculation on corn grain saturation

During milky maturation, bacteria stimulate plant development. The formulations were able to produce an average weight gain of 45-50 g as development progressed, versus an increase of 30 g in the control. I can trace this back to their effect on SPAD values, whereas the less favorable water supply allowed both the assimilates of the plant to flow through half of the pipes, in addition, it was associated with higher root mass during treatment with AlgaFix, which can all be attributed to the positive, stimulating effect of microbial life.

Effect of bacteria on maize grain yield

The plot treated with Bactofil A10 and the area treated with Biofil S produced the best values, producing more yields with a yield surplus of 1.5 t/ha (Figure 4). For Biofil S, steadily increasing grain saturation, high chlorophyll content is easily caused by the treatment, large leaf area during milky ripening, which, together with the high chlorophyll content, increased the flow of large amounts of assimilates.

The combination of Biofil Savanyú + Biofil S products produced the smallest yield increase (approximately 900 kg/ha). This is due to the fact that although it helped the development of the plants compared to the control, but in the first half of the growing season, the bacteria competed with each other at the expense of plant development, which I can attribute to the toxic substances produced as well as the antibiotics produced.

Changes in sunflower root mass as a result of bacterial inoculation

In sunflower experiment the most significant difference in star bud condition was the change in root mass of Bactofil B10, Bactofil B10 + AlgaFix, and Biofil Savanyú. It can be clearly seen that the root mass of the area also treated with AlgaFix was twice as large as the control panel, which may have 2 factors in the background.

First, algae had a stimulating effect on the vegetative mass of plants, as a result of which the root growth also had to keep pace with the above-ground vegetative organic growth, so that it can optimally supply the vegetative mass with water and nutrients. The second factor was that higher root mass was associated with higher bacterial activity around the root, which results in the amount of nutrients that can be used for the larger root, which stimulated root growth. Although the plots treated with Biofil S and Biofil Savanyú + Biofil S exceeded the values of the control plot, but the masses lagged significantly behind the other treatments, which I trace back to, that in the case of the plot treated with Biofil Savanyú + Biofil S preparations, the bacterial strains competed with each other differently stimulated them with root growth. However, in the case of a plot treated with Biofil S, the delayed action of slower-growing bacteria can be inferred from the step, which also resulted in slower rhizoplan layer formation (Figure 5).

Effect of bacterial inoculation on SPAD of sunflower leaves

In the phenophase of the lemon maturation, knowing that the decrease in value, the fall as a result of each treatment was different. The smallest decrease was observed in the plot treated with the combination of Biofil Savanyú + Biofil S formulations, which I can be aware of, that the bacterial flora had recovered by the last third of the growing season, competition was eliminated, which had a positive effect on chlorophyll content, whereas the larger bacterial flora was able to form a more varied composition of rhizoplanes at the root, resulting in a chlorophyll content producing smaller fluctuations. (Figure 6).

Effect of sunflower yield on bacterial inoculations

The best results were produced by the plot treated with Bactofil B10 + AlgaFix, with a yield surplus of nearly 400 kg. The yield surplus can be clearly seen by comparing the yield results of the control, Bactofil B10 and Bactofil B10 + AlgaFix plots, that the algae had the best effect, however, it should be mentioned here, that algae mediate the effect of plant water release on the life of bacteria, they were able to create more favorable conditions, thus, they were better able to make their nutrient exploration work worthwhile, however, which lagged behind plots inoculated with Bactofil B10 alone.

The plot treated with the combination of Biofil Savanyú + Biofil S was below the control plot, which I can trace back to the fact that, as a result of the mixing, the bacterial strains began to compete with each other, resulting in the choice of substances and antibiotics. The plot treated with Biofil Savanyú was able to produce an extra 120 kg yield for the control, thus, the beneficial effect of bacteria was also present in this plot, however, here it is more during vegetative development (Figure 7)

CONCLUSIONS

Algae were best able to affect plant mass as well as chlorophyll content, however, their effect was rather measurable in the long run by the fact that the tissues of plant levels began to age instead of slower, and they were better able to withstand the drought. This is all due to the fact that algae, when penetrating the tissues of plant levels, in conjunction with them, they improve the water supply by introducing the assimilates they produce into plant tissue, and stimulated the synthesis of chlorophyll, which had a positive effect on eye development later in the generative phase.

The effect of bacterial inoculation on yields was extraordinary. This is due to the effect that the rhizoplan layer formed by the bacteria on the roots, revealed nutrients, they could flow more intensively into the tissues of the plant, which in the area treated with bacteria were able to reach the place of fruit formation in the more advanced tracheal passages, thus optimally supplying the formed grains with water and nutrients even in the most unfavorable period.

In conclusion, I can say that there is a raison of bacterial inoculation, because in drought years up to 500-600 kg of crop surplus or even greater results can be achieved through activities as well as through the impact of plant development.

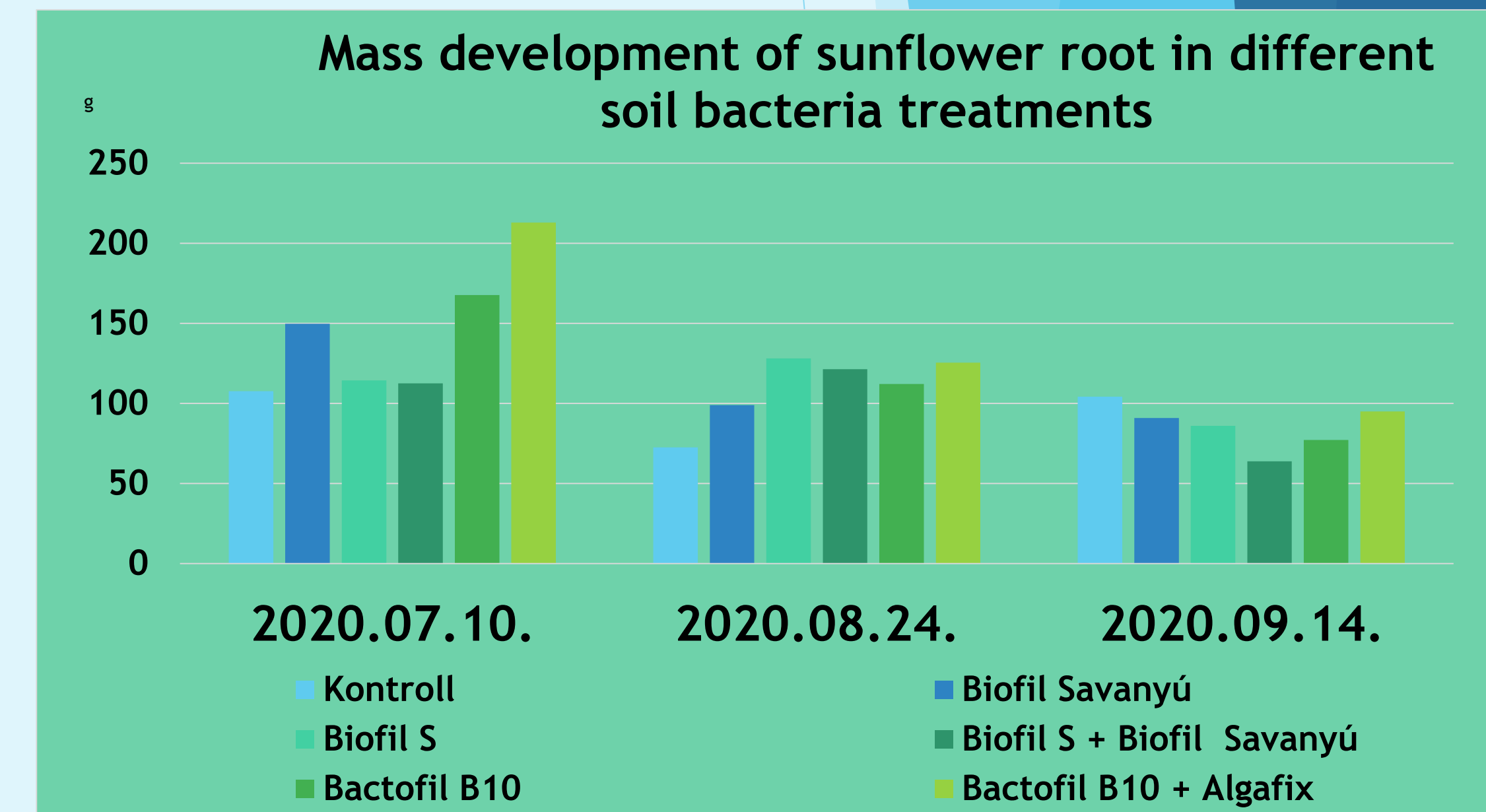


Figure 5: Changes in sunflower root mass as a result of treatments

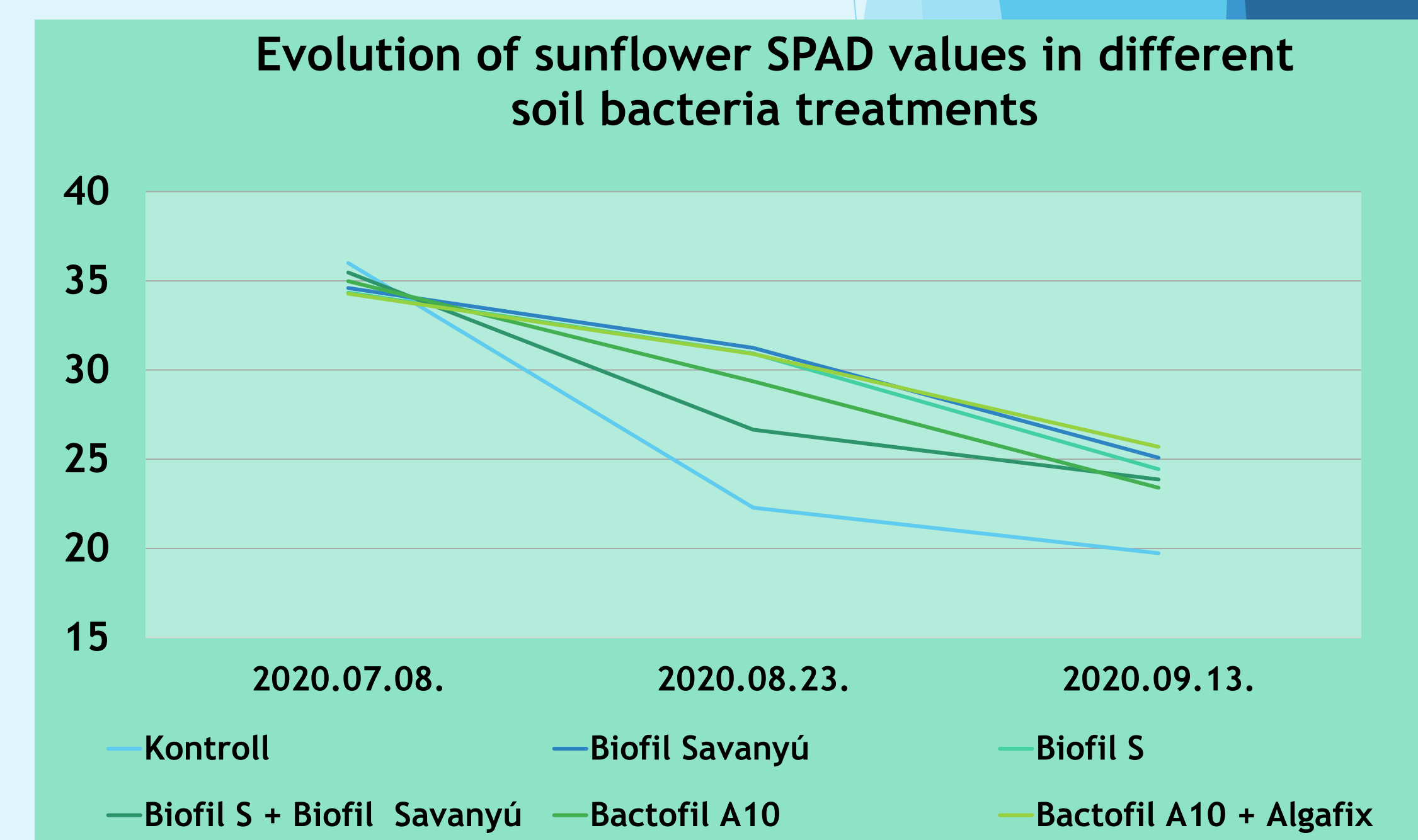


Figure 6: Development of SPAD values of sunflower as a result of treatments

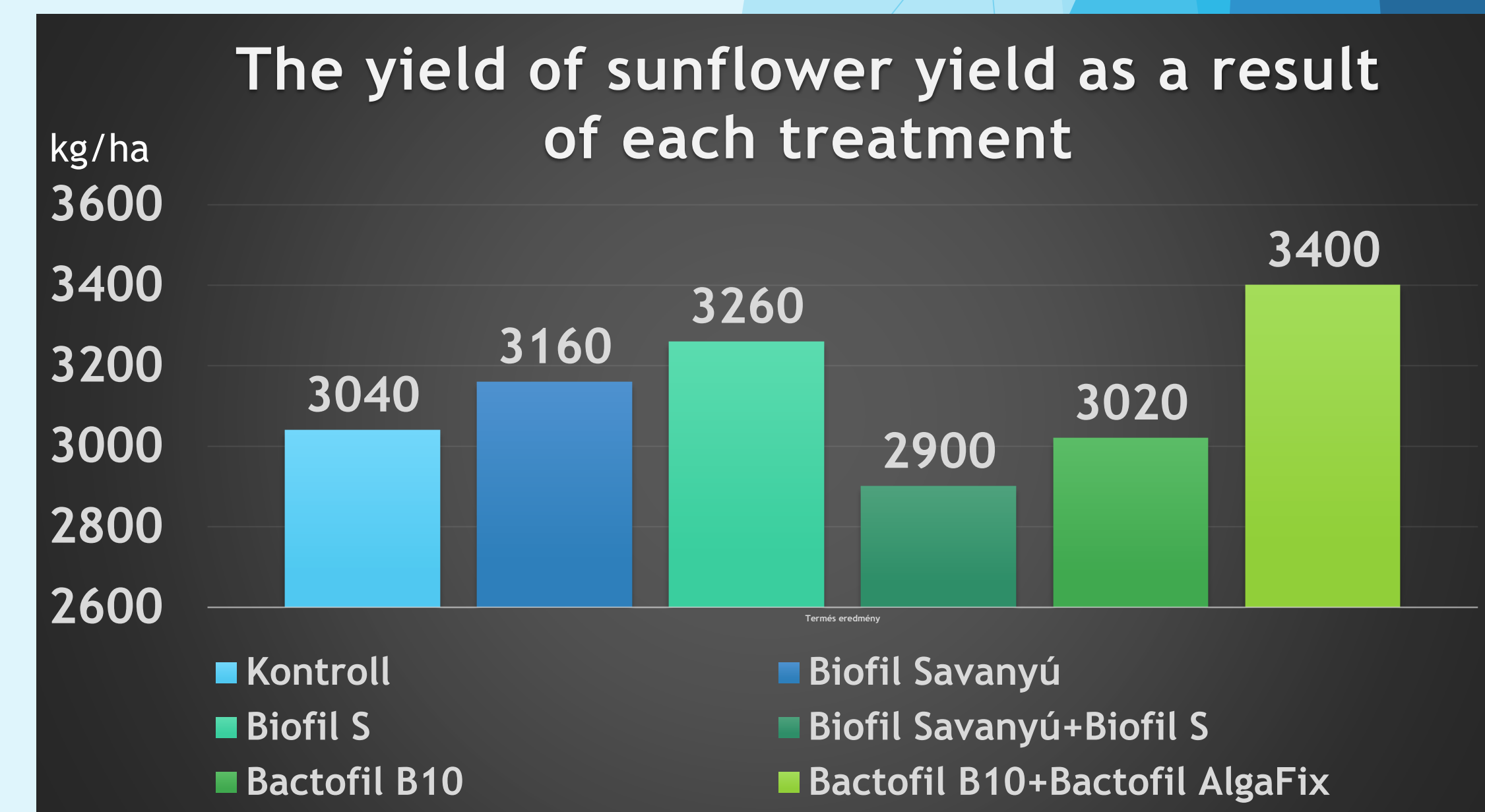


Figure 7: Effect of bacterial inoculation on yield

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