

THE SWEET POTATO YIELD EFFECT OF CULTIVATION IN MONOCULTURE IN

2016-2022

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INTRODUCTION

In Hungary, the history of sweet potato naturalization is more than 100 years old. The first experiments were conducted in 1913 and 1914 on the lands of National Royal Hungarian Plant Production Experimental Station. These experiments with sweet potato were interrupted by the war. In 1949 and 1950 further experiments began with sweet potato in Experimental Farm of Fertőd.

More and more people are growing sweet potatoes in Hungary, but no one has yet tested how long they can be grown successfully on the same soil type. This means the quantitative and qualitative variables of the yield. The sweet potato slips delivered from Bivalyos Tanya Family Farm, this company is one of the biggest propagation materials producer in Hungary.

MATERIALS AND METHODS

In Deszk, we set up the experiment on a 300 m² area for all seven years. Based on a clay loam soil. The area was fallowed for 5 years before 2016 and then planted with sweet potatoes for seven years. We always used the same field, so sweet potatoes were grown in monoculture. We also used the practices of growers in the area for soil preparation and the application of soil disinfectant.

From 2016 to 2022, I planted sweet potato slips in the same area and after four years, the yields decrease significantly. To reduce problems caused by soilborne pathogens, a three to five year rotation of crops is recommended.

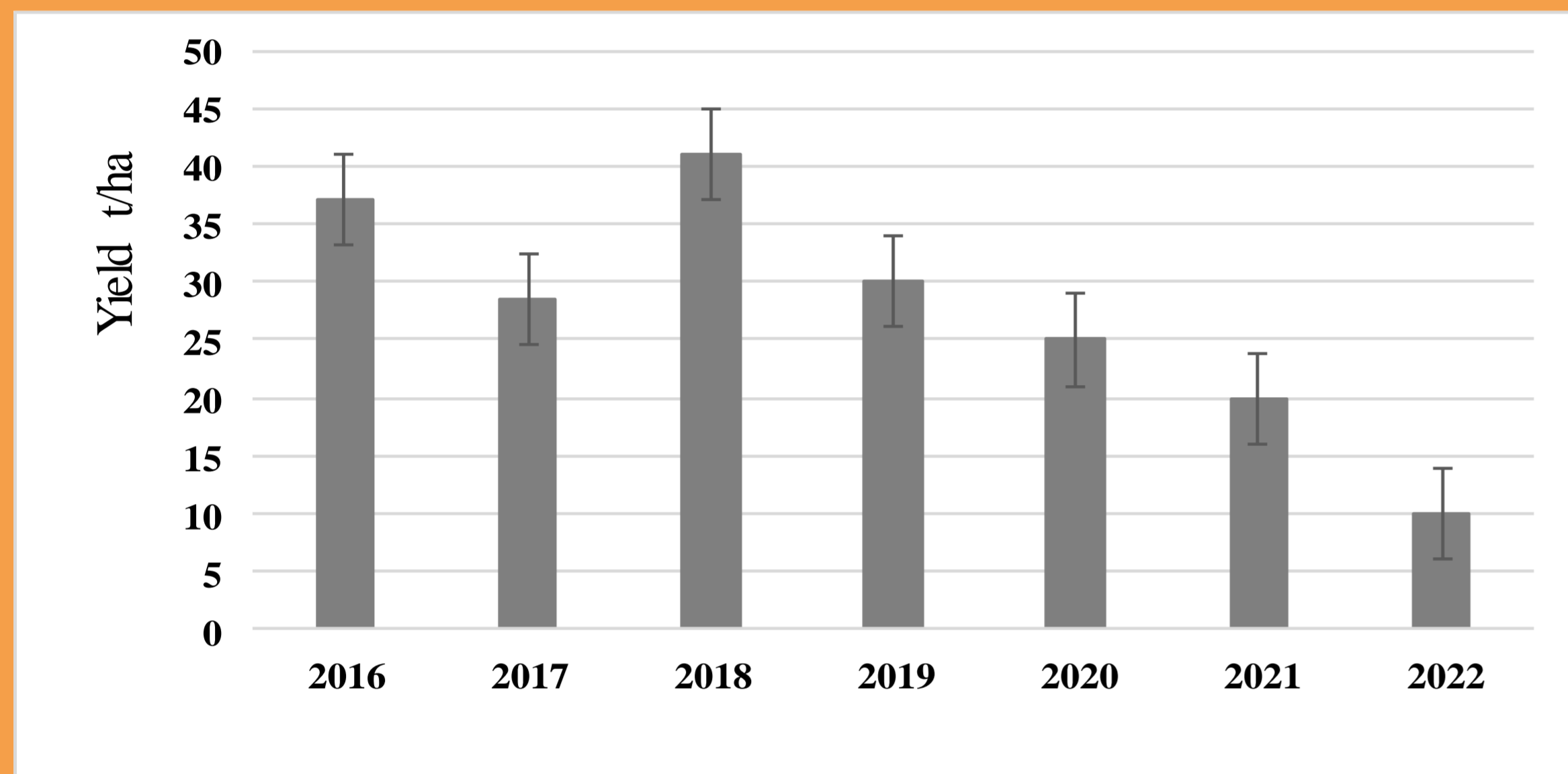


Figure 1. The effect of growing year on sweet potato yield (t/ha) (Deszk, 2016-2022)

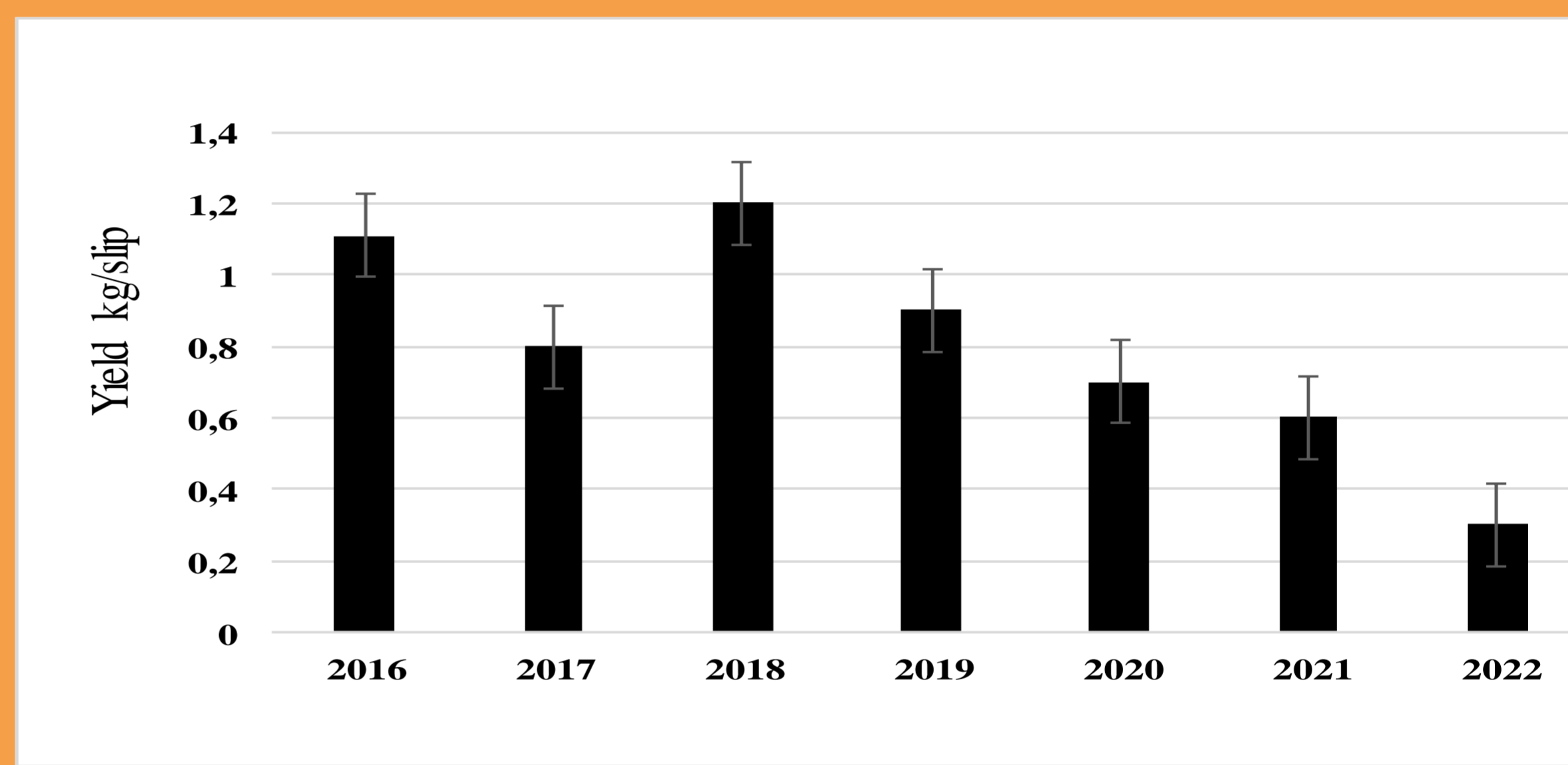


Figure 2: The effect of growing year on sweet potato yield (kg/plant) (Deszk, 2016-2022)

RESULTS

There was a significant difference in yields between seven years ($p < 0.05$), with the highest yield (41.01 t/ha) in 2018, followed by 2016 (37.19 t/ha) and the lowest yield in 2022 (10.01 t/ha) ($p < 0.05$). The total rainfall and average temperature of the 2017 growing season were not favourable, which was also reflected in the yield to a significant extent. We can see that the year 2019 was 30 t/ha, which can be considered as good. From 2020 onwards, we have seen a continuous decrease in yields, which can be attributed to the effect of monoculture (Figure 1.)

The average yield per m² is 1-2 kg, but this is influenced by a number of factors and can be higher in some places. It is not only biotic (living: animal pests, plant disease-causing fungi, viruses, bacteria) factors that cause problems in cultivation, but also abiotic (non-living: climatic conditions, natural disasters) factors. It is very important to observe the correct agrotechnical elements. In the case of sweet potatoes, the most important elements are: planting time, irrigation rate, timely application of nutrients, weed control. Figure 2. shows that the yield /slip data also significantly decreased after 2020.



CONCLUSIONS

The studies show that sweet potatoes can be grown successfully on clay loam soil for four years. In the following years the yield gradually decreased. Thus, it is advisable to set the field aside after four years. I recommend the use of ridges technology because using ridges technology the harvesting is much easier, there will be fewer damaged tubers and the tubers have more room to grow in the ridges. Soil-dwelling pests need to be controlled, as soil-dwelling pests can cause serious problems with crop quality. It is advisable to change soil disinfectants every two years so that soil-dwelling pests do not become resistant to the active ingredient.

Figure 3: Sweet potato monitoring is very important

