

## THE EFFECT OF VARIOUS FERTILIZER TREATMENTS ON THE FOLIAGE WEIGHT AND NUTRITIONAL VALUE OF SWEET POTATO LEAVES

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Sweet potato [*Ipomoea batatas* (L.) Lam.] is the 6<sup>th</sup> most important food crop in the world. Besides the tubers, its foliage is also utilized in many countries as animal fodder as well. At harvesting sweet potato tubers, large amount of foliage is available but most of the time it is considered to be residue. At the same time, however, sweet potato foliage has a good feed value and can be used as a protein feed for animals. Moreover, sweet potato leaves are consumed as a vegetable in many parts of the world. In Hungary, sweet potato has been cultivated for thirty years, but it became well-known for the majority of consumers in the last years only. In Hungary, the storage root yields range between 18 and 25 toons ha<sup>-1</sup>, depending on the production site and the applied technology, while the foliage production can vary from 5.8 to 11.6 tons ha<sup>-1</sup>.

In our work, we evaluated the yield of sweet potato foliage in different fertilizer treatments in 2017 and 2018. We also compared the foliage composition parameters, such as crude protein, raw fat, crude fiber, raw ash and carotene contents in 2016 and 2018. The experiment was conducted in Deszk, South-East Hungary on a clay loam soil of medium to very good nutrient content. There were a total of three treatments including the untreated control. The fertilizer rates (in active ingredient) were the following: Treatment 1 - nitrogen 45 kg ha<sup>-1</sup>, phosphorus 90 kg ha<sup>-1</sup>, potassium 135 kg ha<sup>-1</sup>; Treatment 2 - nitrogen 67.5 kg ha<sup>-1</sup>, phosphorus 90 kg ha<sup>-1</sup>, potassium 180 kg ha<sup>-1</sup>. Leaf samples were taken from the three different fertilizer treatments in September. Leaf samples were taken from the three different fertilizer treatments in September, shortly before harvesting. Analysis of foliage composition was carried out in the Feed Testing Laboratory of the University of Szeged Faculty of Agriculture in Hódmezővásárhely.

To determine the relationship between the fertilizer treatments and sweet potato foliage weight, the foliage was cut and weighed before harvest in 2017 and 2018. Our results show that the fertilizer Treatment 2 increased the sweet potato foliage weight. Both in ridge and flat planting technology, Treatment 2 had a significant effect on sweet potato foliage weight. Extrapolating the foliage weight values to one hectare, the highest results of 11.64 tons ha<sup>-1</sup> in flat and 10.43 tons ha<sup>-1</sup> in ridge planting were achieved with the fertilizer Treatment 2 in 2018.

The analysis of the nutritional value of sweet potato leaves in 2016 and 2018 gave the result that compared to the composition of alfalfa harvested in the optimal green bud stage, the content of crude fat, crude ash and carotene was much higher in the sweet potato foliage. There was no significant difference, however, between the control and the two fertilizer treatments.

We can conclude from our results that sweet potato foliage – being available in large amounts at harvest – has a composition comparable to alfalfa of green bud stage. Alternative uses for the vines can be returning them to the field for mulching or using them as a feed for animals. As it is common in numbers of countries, the tender leaves can also be used as vegetable. Sweet potato foliage is not expected to become the subject of trade but its on-farm utilization can considerably contribute to the saving of forage costs.