



# Early spring cultivation of dill (*Anethum graveolens* L.)

## INTRODUCTION

Dill (*Anethum graveolens* L.) is an annual plant originally native to Mediterranean area. The fresh herb has been used in folk medicine for many kind of aches specially stomach deaseses. Fresh and dry dill is commonly used in salads, sauces and a spice in pickles.

The short period of vegetation of leafy vegetables allows intensifying their production. Early spring term of cultivation may be dangerous especially for young plants exposed to cold temperature, then cause thermal damage affecting the physical and chemical quality of the product. Usage of cover or a tunnel could establish prolonging cultivation term and obtaining earlier high quality yield. Attractive look and high quality involves not only a way of production and method of storage of the raw material but also its chemical composition. Dill herb is extremely rich in many kind of natural pigments especially in chlorophyll and carotenoids. Chlorophyll is the main pigment of seasonal herbs. Carotenoids similar to vitamin C and polyphenols have strong antioxidant properties. In the spring months due to the low light intensity negative nitrate compounds may be accumulated in cultivated plants.

## MATERIAL AND METHODS

The experiment was carried out in 2010-2012, on the Experimental Field and at the Vegetable Storage Lab of the Department of Vegetable and Medicinal Plants SGGW. The study included two cultivar of dill i.e. 'Lukullus' and 'Super Dukat'. Seeds were sown on 31. 03, 15.04 within the tunnel and 30.04 directly in open field.

Sampling prepared for analyses ranged among 10 g for nitrates and total sugars and 0,25-0,26 g for total carotenoids. In case of essential oils it was 100 g of raw material.

The experiment was set on three replications. The results were analyzed statistically with the two factor analysis of variance at the level of significance  $\alpha=0,05$  (ANOVA 2).

Nitrates content was measurement using spectrophotometric method, with FIAstar 5000 device (Foss Tecator AB Sweden 1990) and total sugars with Luff-Schoorl method (Charłampowicz, 1996). Total carotenoids were extracted with using of 80% acetone and determined according of spectrophotometric method and essential oil content was determined by the Deryng apparatus and then evaluated by gas chromatography (GC).

## RESULTS

The experiment has shown that the highest amount of carotenoids compounds observed in plants cultivated in second term of harvest (2,70). Content of investigated pigments was on similar level in both cultivars.

Fresh herb harvested in the end of June content approximately three times more essential oil than in other term (0,16).

It was observed that a raw Dill herb from open field cultivation characterized with low accumulation of nitrates compare with material from tunnel. The highest content of total sugars measured in herb obtained from last term of harvest.

## CONCLUSIONS

1. Usage of tunnels doesn't decrease nitrates accumulation.
2. Late term of cultivation increases content of total sugars and essential oil.
3. Covers positive affect concentration of carotenoids in dill herb

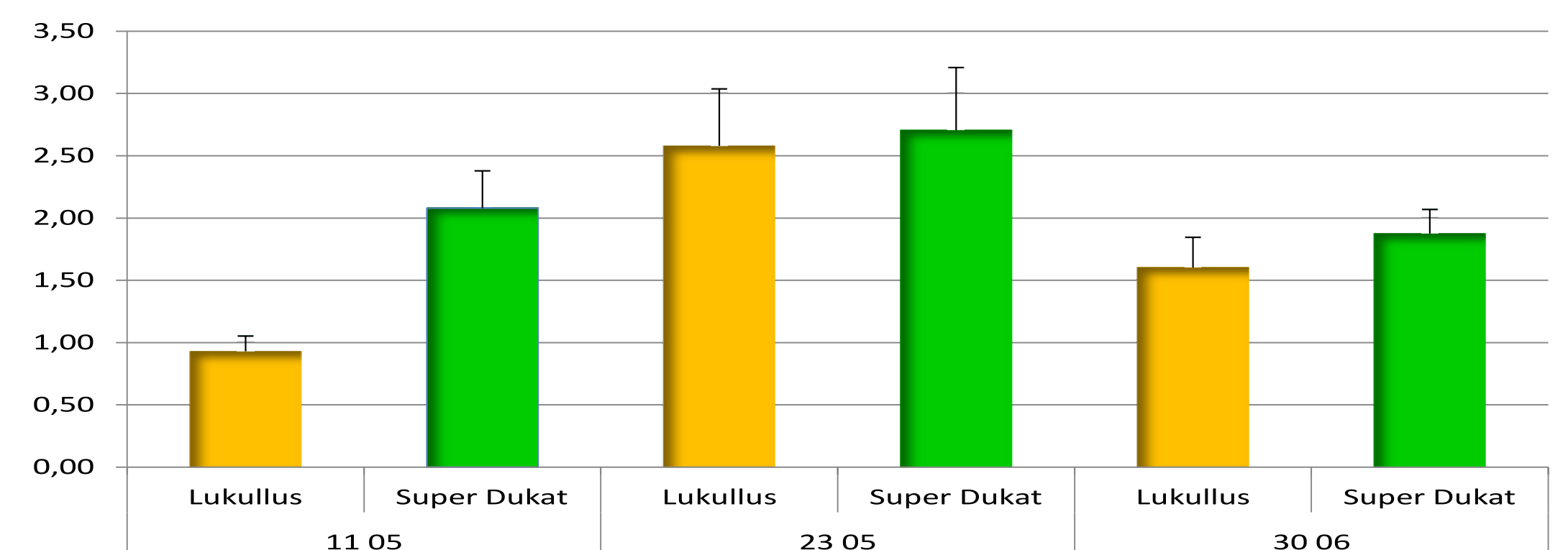


Figure 1. Influence of term of harvest on the content of total carotenoids in Dill ( $\mu\text{g}\cdot 100\text{ g}^{-1}$ )

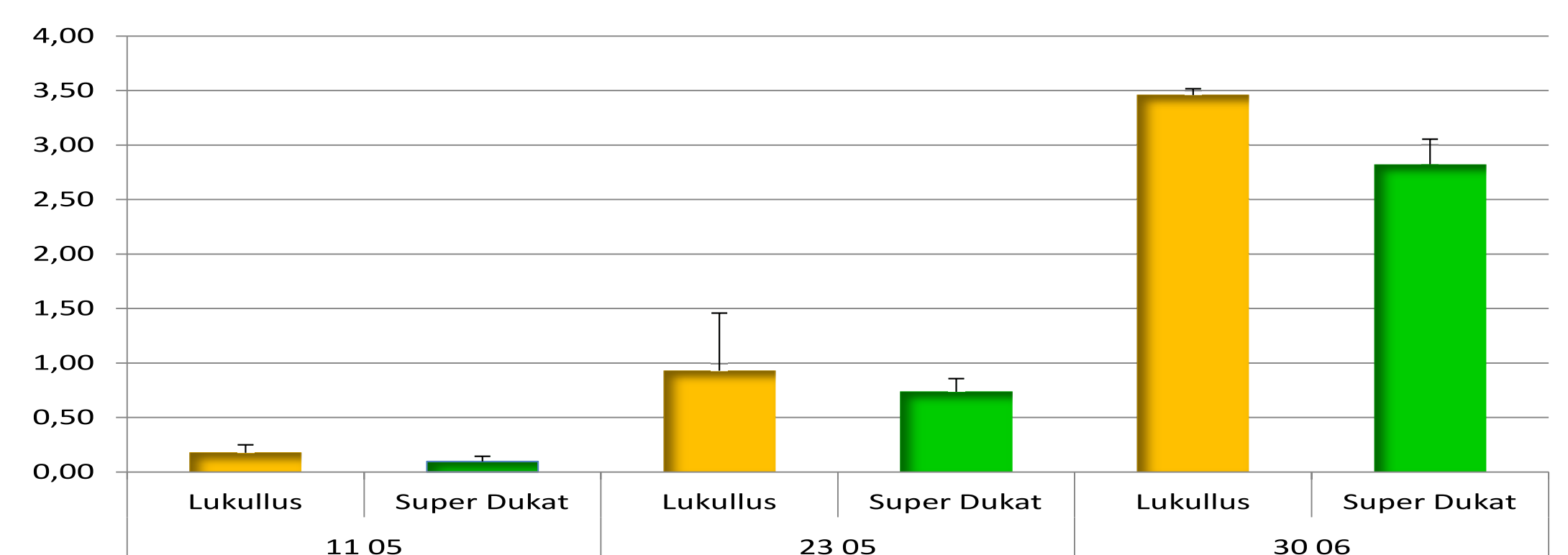


Figure 2. Influence of term of harvest on the content of total sugars in Dill (g/100 g)

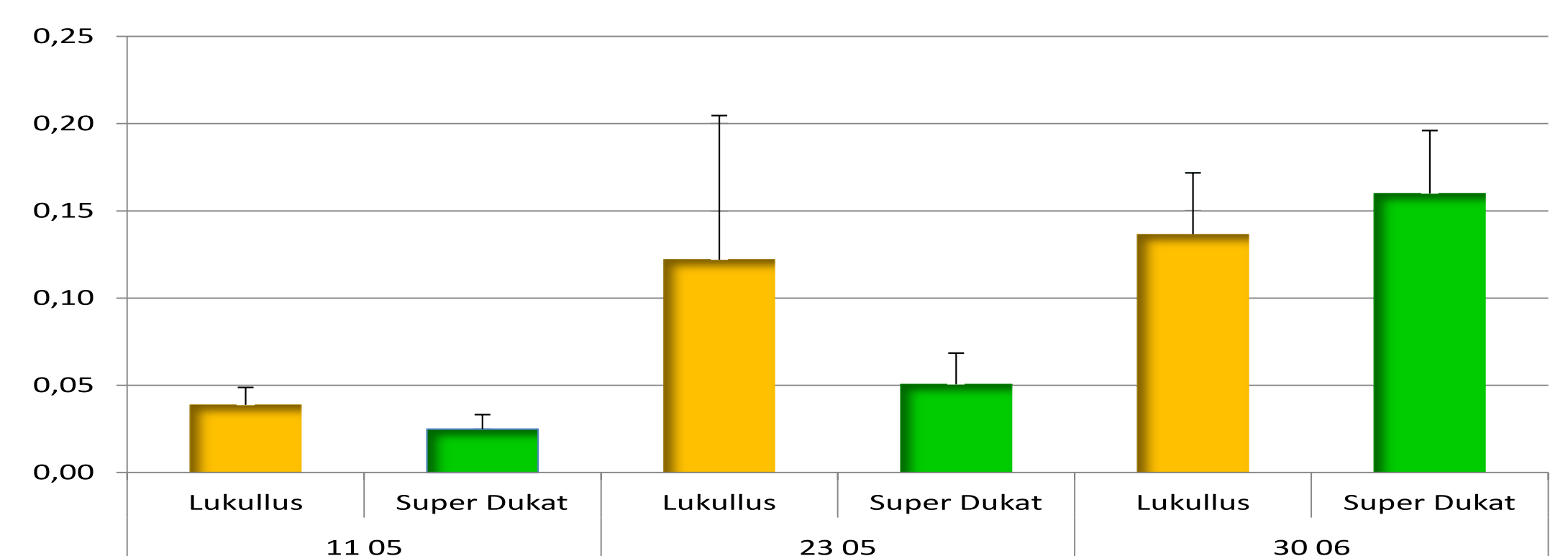


Figure 3. Influence of term of harvest on the content of essential oil in Dill (%)

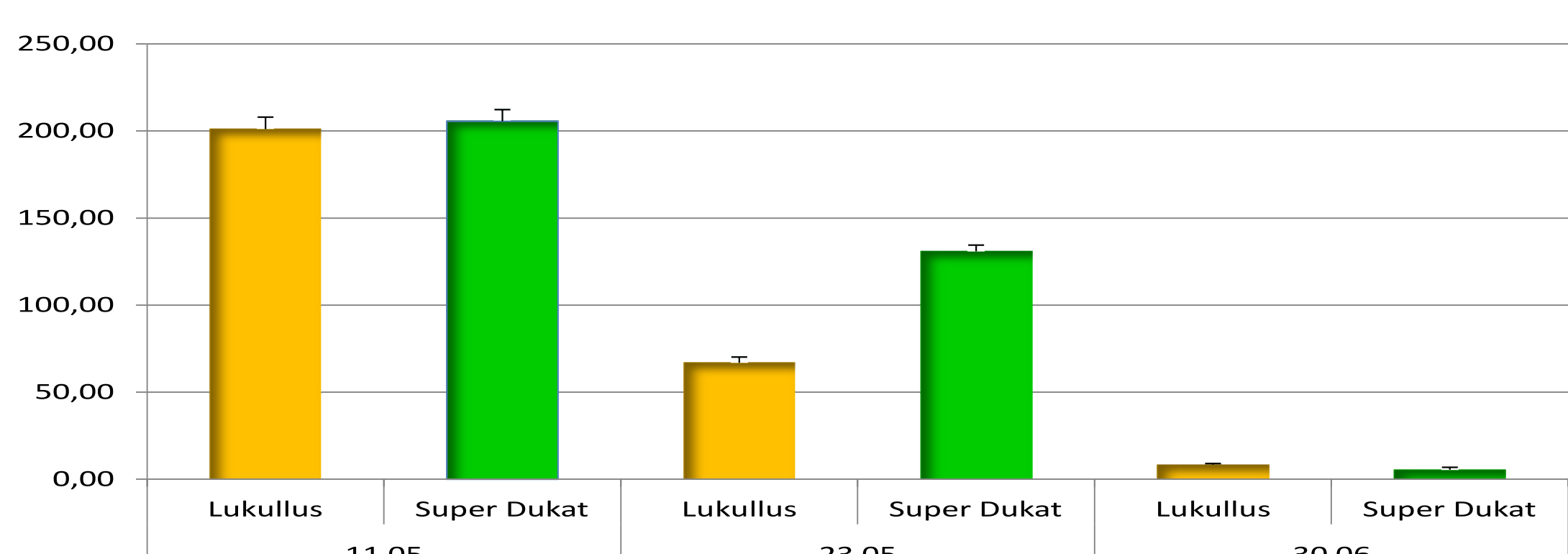


Figure 4. Influence of term of harvest on the content of nitrate in Dill (mg NO<sub>3</sub>/100 g)



## LITERATURE

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