

## **The Effects of Some Technological Sequences and Environmental Factors on Plant Development and Yield of Kale (*Brassica oleracea* var. *acephala* L.)**

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**Abstract.** Kale or *Brassica oleracea* L. var. *acephala* is not well known and cultivated in our country, so it could be considered a new vegetable or a very rare one. From the *Brassicaceae* group, kale is the most valuable in terms of nutrition. The therapeutic qualities of kale are recognized since antiquity by Hippocrates, Pliny the Elder, Cato the Elder, Galen. Kale was considered a panacea by the romans. The main purpose of this paper was to establish an optimal sowing date that ensures the highest yield, adapted to the specific environmental factors of Transylvania. The organized experience was tri-factorial, with factor A - planting period, factor B - hybrid and factor C - seedling type. All factors had two graduations, thus resulted 8 experimental variants. The first planting period was the second decade of May and the second period was the third decade of June. The hybrids used were F1 Winterbor and F1 Redbor and the seedlings, one part were transplanted and the other part were not transplanted. The crops from the first planting period achieved the best results. The conducted study concluded that kale is sensitive in the immediate period after planting in terms of environmental conditions, especially regarding the humidity and temperature. Thus, in regards to the environmental conditions of the Transylvanian Plateau, optimal planting period for kale is the third decade of April.

**Keywords:** kale, planting date, hybrid, seedlings, transplanting.

### INTRODUCTION

Kale or *Brassica oleracea* L. var. *acephala* is not well known and cultivated in our country, so it could be considered a new vegetable or a very rare one. From the *Brassicaceae* group, kale is the most valuable in terms of nutrition. The therapeutic qualities of kale are recognized since antiquity by Hippocrates, Pliny the Elder, Cato the Elder, Galen. Kale was considered a panacea by the romans (Pârnu, 2005).

Whipker (1998), recommends sowing kale in June, for temperate climates because plants generally need about 2 to 2.5 months to reach maturity. Drost *et. al.* (2010), recommends choosing cultivars with short vegetation period for the autumn harvest. These cultivars are sown with 50-75 days before the date on which it is desired to achieve harvest. The date when maturity is reached must be 2-3 weeks after the arrival of the first autumn frost. A study in Canterbury, conducted by Brown *et. al.* (2007) in New Zealand, regarding the influence of sowing period on yield and its quality in kale, led to the following conclusion: the early period (October 1) recorded higher production due to higher temperatures of the vegetation period.

Regarding the seedlings, Berar (1998), Indrea and Apahidean (2004), says that while production costs established by seedling crops are higher, they are compensated by a higher recovery of early production or by double crops.

The kale crops can be established by direct sowing, but for small areas the crops are obtained from seedlings in the field. Transplanted seedlings can be obtained also in nutrient cubes 5x5 cm, but for larger areas untransplanted seedlings with an age of 15-20 days are



















