

## **THE EFFECT OF VERNALIZATION, GIBBERELLINS AND FERTILIZATION BY HUMIC ACID ON THE GROWTH AND PRODUCTION OF CABBAGE (*Brassica oleracea* var. *capitata*)**

**Nashwan Abdulhameed Abbas\***

**Prof. Hameed Salih Hammad\*\***

\*Dept. of Horticulture and Landscape Gardening - College of Agriculture - University of Diyala - n33377n@gmail.com.

\*\* Prof.-Dept. of Horticulture and Landscape Gardening - College of Agriculture - University of Diyala - drhsh\_57@yahoo.com

### **ABSTRACT**

An experiment was conducted in Al-Haronia district of Al-Muqadiyah city in Province of Diyala during the agricultural season of 2013-2014 to investigate the effect of vernalization by four application methods (unvernalized plants, vernalized plants by seeds, vernalized saplings and vernalized by seeds and saplings). It deals with effect of Gibberellins spraying with three rates of concentration 0,75,150 mg per 1 liter as well as the effect of Humic acids spray with three rates of concentration 0,100,200 mg per 1 liter in growth and harvest of cabbage (*Brassica oleracea* var. *capitata*). A factorial experiment was fulfilled by using a Split-split plot design and three blocks. The outcomes proved that, Vernalization, Gibberellins and Humic acids have statistically significant impact on the features of vegetative growth and certain effect on the product with significant varieties among the applications specifically that of comparison.

The vernalized plants by seeds were of higher values in terms of (the number of inner leaves, the required duration for the growth of 50% of cabbage head, the total weight of the plant, the total weight of the harvest). The values can be distributed respectively as follows: 47.44 leaf per plant<sup>-1</sup>, 71.14 day, 2.51 kg and 25.16 ton per donam 1000 sq.m.. The sprayed plants by Gibberellins proved higher values particularly with concentration of 150 mg per 1 liter<sup>-1</sup> in terms of the following features (the number of leaves, the total weight plant, and the total weight of the harvest). The values can be distributed respectively: 46.31 leaf per plant<sup>-1</sup>, 4.00 kg, and 26.33 ton per donam 1000 sq.m.. The sprayed plants by Gibberellins with concentration of 75 mg per 1 liter proved higher values in terms of the following features (the required duration for the growth of 50% of cabbage heads) and their values were distributed respectively: 69.83 day. The sprayed plants by of Humic with concentration of 200 mg per 1 liter proved higher levels in the following features (the number of leaves, and the required duration for growth, the total weight of the plant, the weight of cabbage head, the total weight of the harvest) and their values were listed respectively out of the following: 47.11 leaf per plant<sup>-1</sup>, 71.25 day, 4.10 kg, 28.27 kg per dunum<sup>-1</sup>. In respect to triple interferences or three-way interactions, the vernalized plants by seeds and sprayed plants by Gibberellins with concentration of 75 mg per 1 liter and the sprayed plants by humic with concentration of 200

mg per 1 liter-1 presented higher values in the following characteristics (the required duration for the growth, the total weight of the plant, the total weight of the crops) and their values are presented respectively: 67.33 day, 4.66 kg, and 33.50 kgs per1 donum. The vernalized plants by seeds and sprayed plants by Gibberellins with concentration of 150 mg per 1 liter-1 along with sprayed plants by humic acids with concentration of 200 mg per 1 liter showed higher values in the following features (the number of inner leaves) and their values are showed successively as in 53.00 leaf.

**Key word** :cabbage, Vernalization, Gibberellin, Humic acid.