SUMMARY AND CONCLUSION

Three field experiments were carried out during the growing seasons of 1983/84 and 1984/85 at the Experimental Farm of the Faculty of Agriculture Moshtohor, Zagazig University (Benha Branch) to elucidate the effect of some commercial folifertilizers, chelated micronutrients or growth regulators foliar application on vegetative growth, chemical composition of leaves , flower head yield and quality of artichoke plants cv. Herious (French).

First Experiment :

It included 10 treatments resulted from 3 levels (0.1, 0.2 and 0.4 %) for each of the commercial folifertilizers Irral, Bayfolan and Folifertile plus untreated control treatment. Sprays were done three times at 60, 80 and 100 days from planting. Obtained results can be summarized as follows:-

1. All used folifertilizers treatments significantly enhanced plant vegetative growth characteristics i.e. plant height, number of leaves/plant and length as well as fresh weight of the 4th leaf. In this respect, the most favourable treatments were Irral at 0.1%, Bayfolan at 0.4% and Folifertile at 0.2%. On the other hand, studied folifertilizers had either no significant effect or even depressed dry matter percentage of the 4th leaf .

2. Most of folifertilizers treatments significantly promoted chlorophyll a, b as well as carotene content of leaves, whereby Irral at 0.1%, Bayfolan at 0.4% and Folifertile at 0.3% were superior, especially with regard to chlorophyll.

3. All examined folifertilizers treatments increased N, P and K % in leaves than the control. The medium used level (0.2%) of all folifertilizers was best regarding N and P%. Whereas, high medium and low level of Irral, Bayfolan and Folifertile, respectively were superior regarding K%.

4. All studied folifertilizers treatments increased significantly reducing and total sugars content of plant leaves reaching its maximum values when Irral, Bayfolan and Folifertile were added at 0.1, 0.4 and 0.2%, respectively. With regard to non-reducing sugars, non difinite trend could be concluded.

5. Early flower head yield by weight and number either per plant or per feddan as well as average weight of flower head had been greatly increased due to various folifertilizers application. The most favourable effect was noticed by using 0.1% Irral 0.4% Bayfolan or 0.1% Folifertile, hence it increased early yield as kg/plant by 150, 149 or 143 %, respectively over the control.

6. All used folifertilizers treatments increased average

Flower head weight as well as total yield by weight and number either per plant or per unit area. Whereas, Irral at 0.1, Folifertile at 0.2 or Bayfolan at 0.4% were the most pronouncing treatments inducing an increase of 55, 44 or 34 %, respectively in plant yield productivity by weight over the control during both seasons.

7. Foliar folifertilizers application obviously enhanced length and diameter of produced flower heads as well as thickness, diameter and fresh weight of their receptacles (edible parts). Moreover, it increased dry matter, N, P and K percentages as well as reducing and total sugars content of receptacles. Treatments that induced highest total flower head yield were the most superior in this respect.

It may be concluded that for getting the highest early flower head yield productivity with best quality it is advisiable to spray artichoke plants three times at 60, 80 and 100 days from planting with 0.1 % Irral, 0.4% Bayfolan or 0.1 % Folifertile. As for total flower head yield production, the same previously mentioned levels of Irral and Bayfolan or 0.2 % of Folifertile may be recommended.

Second Experiment:

This experiment consisted of 10 treatments, which resulted from 3 levels of each of Fe (60, 90 and 120 ppm),

Mn (192, 288 and 384 ppm)
and Zn (112, 168 and 224 ppm) in chelated forms plus untreated control treatment. These micronutrints were sprayed three times at 20 days intervals starting two months after planting. The most important results were as follows:

1. All micronutrients treatments mostly enhanced significantly all studied vegetative growth characteristics compared to control. Medium levels of both Fe and Mn and high one of Zn exceeded all other treatments in this respect.

2. Among studied treatments, Zn at its lowest level (112 ppm) followed by Mn at its medium used level (288 ppm) led to the highest increment in photosynthetic pigments content in artichoke plant leaves.

3. Although P% of leaves had not been significantly affected due to all tested micronutrients, N as well as K percentages were significantly enhanced, whereby medium Fe level (90 ppm) as well as the low level of each of Mn (192 ppm) and Zn (112 ppm) were best in this respect.

4. Foliar application of Fe, Mn or Zn within all used concentrations significantly increased the reducing and total sugars content of leaves compared to control.

High Fe as well as low Zn levels were inferior in this respect. Non-reducing sugars were positively affected only during the first season, where medium level of each of Fe and Zn were best.

5. All micronutrients treatments significantly improved flower heads early yield parameters. In a descending order, Zn, Fe and Mn at their highest levels were best, since it induced 209, 174 and 154% , respectively early flower head yield as kg/plant over the control during both seasons.

6. All tested micronutrients treatments significantly increased flower heads total yield parameters with the superiority of Mn and Fe at their medium levels and Zn at its high level, which resulted in 75, 59 and 51%,respectively over the total yield of control treatment as kg/plant during both seasons. Such increment is mainly due to the improving effect of such treatments on average flower head weight and its number per plant as well.

7. Fe, Mn or Zn foliar application with various used rates improved significantly studied physical characters of either flower head or its receptacle. Furthermore, it enhanced dry matter, N, P and K percentages as well as reducing and total sugars content of the edible part (receptacle) of artichoke.

It may be concluded that for producing the highest early flower head yield productivity, the high used levels of either Zn (224 ppm), Fe (120 ppm or Mn 384 ppm in their chelated forms may be recommended in case of total flower head yield production, it is advisable to use either the same high Zn level or themedium levels of both Mn (288 ppm) or Fe (90 ppm).

Third Experiment:

This experiment contained 10 treatments gained from three levels of each of GA_3 (50, 100 and 200 ppm), CCC (500, 100 and 2000 ppm) and NAA (100, 200 and 400 ppm) plus untreated control treatment. Growth regulators were sprayed on artichoke plant foliage three times at 20 days intervals starting two months after planting. Obtained results will be summarized as follows:

1. All used growth regulators within all tested concentrations mostly enhanced all studied vegetative growth parameters, except dry matter percentage of 4th leaf. The most effective treatments were 200 ppm GA_3 with regard to plant height and leaf length, 1000 ppm CCC regarding leaf fresh weight and 200 ppm NAA with respect to number of leaves per plant.

2. Growth regulators used did not significantly affect either chlorophyll a or carotene content of leaves.

Contrasting to CCC treatments, chlorophyll b content was gradually increased as GA_3 or NAA levels increased. As for total chlorophyll content, using of 100 ppm GA_3 or 400 ppm NAA were of the most pronouncing effect.

3. GA_3 application mostly increased N, P and K percentages of levels than control, however, CCC treatments showed no significant effect in this respect, except 500 ppm, which significantly increased N%. Meanwhile, NAA treatments mostly increased N and P percentages but no clear trend could be dectected regarding K % of leaves.

4. The highest reducing sugars content in leaves was associated with using highest level of either GA_3 (200 ppm) or NAA (400 ppm), meanwhile a decreasing tendency was noticed as CCC levels increased. As for non-reducing sugars content, used growth regulators treatments showed a retarding effect in this respect, except low level GA_3 and medium level of the both CCC and NAA.

5. All used growth regulators, with the superiority of GA_3 treatments enhanced flower heads early yield productivity. For each growth substance, the most enhancing concentration was 200 ppm GA_3, 200 ppm NAA, and 2000 ppm CCC, hence it resulted in 220, 88 and 43 % increment in early yield as kg/plant over control during both seasons.

6. Studied growth regulators treatments significantly promoted flower heads total yield productivity by weight and number compared to control. The super treatment of each growth substance was GA_3 at 50 ppm, CCC at 500 ppm and NAA at 200 ppm, which produced 65, 49 and 46 % respectively over control as kg/plant during both seasons.

7. Contrasting to the effect on flower head diameter, GA_3 enhanced flower head length, CCC depressed it, meanwhile NAA showed no significant effect. With respect, to flower head receptacle, all used growth substances generally improved its studied physical parameters as well as dry matter, N, P and K percentages compared to control. As for reducing and total sugars content, GA_3 proved to be of a depressive effect however both CCC and NAA were of moderate stimulative effect. A retarding influence on non-reducing sugars could be dectected as a result of GA_3 or CCC applications. However, the effect of NAA on non-reducing sugars during both seasons was flactuated.

It may be concluded that GA_3 foliar application showed the most enhancing effect on flower head early as well as total yield productivity as compared with either CCC or NAA. For export purposes the high GA_3 used level (200 ppm) may be recommended. For improving total yield any of (50 ppm) GA_3, 500 ppm CCC or 200 ppm NAA may be advisable.