V- SUMMARY

This investigation was carried out on *Tanacetum vulgar* L. plants in El–Maghara Research Station-Desert Research Center at 100 km South El–Arish city in the middle of Sinai during the two successive seasons of 2002/2003 and 2003/2004

The purpose of this study was to study the effect of sowing date, some applying biofertilizers , organic manure and chemical constituents of *Tanacetum vulgare* plant.

The treatments which were used in this work were as follows:

Fertilizers treatment :

F1 Ammonium sulphate 450 kg /fed.

F2 Biofertilizer + ammonium sulphate 300 kg /fed

F3 Biofertilizer+10 m^3 poultry manure/fed

F4 Biofertilizer + ammonium sulphate 300 kg /fed +10 m^3 poultry manure.

F5 Biofertilizer+2ton compost/fed

F6 Biofertilizer + ammonium sulphate 300 kg /fed + 2ton compost/fed

F7 Biofertilizer + 10 m^3Biogas manure/fed.

F8 Biofertilizer + ammonium sulphate 300 kg /fed +10 m^3Biogas manure/fed.

The obtained results can be summarized as follows:

V-1- Effect on Vegetative growth parameters:

IV-1-1-Effect on Plant height (cm)

The obtained results indicated that the tallest plant of *Tanacetum vulgare* was recorded in the first cut when the plants were sown in summer and fertilized with F_6 (Biofertilizer + ammonium sulphate 300 kg /fed + 2ton compost/fed)

This trend was true only in the first season, while in the second one sown the seeds of *Tanacetum vulgare* in the winter or summer and fertilized with F_6 showed its superiority in the first cut for this parameter compared to plants treated with the recommended dose.

V-1-2-Number of branches/plant:

Results showed that sown the plants in summer and treated with F_6 was found to be the most effective treatment for producing the greatest number of branches at the first cut in both seasons of this study.

V-1-3-Effect on Fresh weight /plant(g):

It was obvious that the heaviest fresh weight of herb/plant (g) of *Tanacetum vulgare* in both seasons was obtained by sown the plants in summer and fertilized with F_6 at the first cut followed descendingly by using F_7 when the plants sown in summer at the first cut.

Additionally, sown the plants in summer and treated with the recommended dose at the first cut ranked the third in this concern

when compared with the abovementioned treatments and other treatments in both seasons of this study.

V-1-4-Effect on Dry weight /plant (g):

The obtained results cleared that the greatest dry weight of herb/plant of *Tanacetum vulgare* plants was gained in the first cut when the plants sown in the summer and fertilized with F_6 followed dissentingly by using the treatment of F_7 when the plants sown in the summer at the first cut. Also, sown *Tanacetum vulgare* plants in the summer and treated with the recommended dose induced highly significant increases in this parameter in the first cut when compared with the rest treatments in both seasons.

V-2-Effect on flowering parameters:

V-2-1--Number of flower heads/plant:

It was found that sown *Tanacetum vulgare* plants in summer and fertilized with F_6 is being to be the most effective treatment for inducing the highest number of flower heads / plant at the first cut as compared with the recommended dose which ranked the second in this concern in both seasons.

V-2-2-Fresh weight of the flower heads/plant (g):

It was clear that sown *Tanacetum vulgare* plants in the summer and fertilized with F_6 showed to be the most effective treatment for producing the heaviest fresh weight of flower heads/plant (g) in the second cut, followed descendingly by using the same treatment but in the first cut. Besides, plants sown in the summer and treated with F_1 and F_7 resulted in highly significant increment in this parameter in the second cut in both seasons of this study.

V-2-3-Dry weight of the flower heads/plant(g):

It was found that sown *Tanacetum vulgare* plants in the summer and fertilized with F_6 approved to be the most effective treatment for inducing the heaviest dry weight of flower heads/plant (g) at both cuts. Also, sown the plants in the summer and treated with the recommended dose (F_1) produced highly increments in this parameter at the second cut followed dissentingly by sown the plants in the summer and fertilized with F_7 at the first cut.

V 3-Effect on chemical constituents:

V-3-1- Effect on Essential oil percentage in the fresh leaves (%):

The highest essential oil percentage (%) in the fresh weight at the first season was obtained in the first cut when *Tanacetum vulgare* plants were sown in the summer and treated with the recommended dose (F_1) followed descendingly by sown the plants in the summer and fertilized with F_6 at the first cut, while in the second one the greatest essential oil percentage in the fresh leaves was gained at the second cut when the plants of *Tanacetum vulgare.* was sown in the summer and treated with the recommended dose (F_1) followed by sowing the seeds in the winter and treated with F_6 at the second cut.

V-3-2-Essential oil percentage in the flower heads/plant (%):

Sown *Tanacetum vulgare* plants in the summer and treated with (F_1) recommended dose induced the highest mean values of this parameter followed by sown the plants in the summer and treated with F_6 at the first cut, this trend was true only in the first season, while the second one, the highest essential oil percentage

(%) in the flower heads/plant was obtained in the second cut when the plants was sown in the summer and fertilized with the recommended dose (F_1) followed descendingly by sown the plants of *Tanacetum vulgare* in the winter and treated with F_6 at the first cut.

V- 3-3- Effect on essential oil composition :

Analyzing the volatile oil of tansy plants using G-C Mass spectrometry picnics raveled there were differences in the main components of the oil, according to the treatments used in this investigation,

The oil of the flowers gathered in summer: the main component detected was camphor (47.84%) followed descendingly by2-ethoxy-3-4-dihydro-5-methyl-3-methylene-2H-pyran (32.38%) then d-thujone (2.98%).

Compared to the oil of the flowers cut in winter contend camphor as the main compounded (41.55%) this percentage was less than that of the flowers in summer followed descendingly by (2-ethoxy-3, 4-dihydro-5-methyl 3-methylene-2H-pyran (6.16%) then camphene (5.38%).

As far as the oil obtained from the flower heads of the plants treated with (F6) recorded the highest chrysanthenyl acetate percentage (39.73%) followed descendingly by camphor, the percentage (30.26) followed descendingly by (d-isothujone). The percentage (9.90%).

V- 3-4- Leaf total nitrogen content (%):

The highest mean value of leaf total nitrogen content (%) was obtained by sown the plants of *Tanacetum vulgare.* in winter or summer and treated with F_6 in both cuts, followed descendingly by sowing the plants of *Tanacetum vulgare.* in winter or summer and treated with the recommended dose F_1 (Ammonium sulphate 450 kg /fed) in the first and second cuts in both seasons of this study.

V- 3-5- Leaf total phosphorus content (%):

In the first season, it was found that the greatest leaf total phosphorus content (%) was recorded in the first cut when the plants of *Tanacetum vulgare* was sown in the winter and fertilized with F_6 and F_1 (recommended dose), while in the second season the highest mean values of leaf total phosphorus content (%) were obtained by sown the seeds of *Tanacetum vulgare* in the summer and treated with F_6 in the second cut followed descendingly by sown the seeds of *Tanacetum vulgare.* in the summer and treated with F_6, F_7 and F_1 (Ammonium sulphate 450 kg /fed) in both cuts.

V- 3-6 - Leaf total potassium content (%):

The obtained results showed that the greatest leaf total potasssium content (%) was gained in the first cut when the plants of *Tanacetum vulgare* was sown in the winter and treated with F_3 followed by sown the seeds in the summer and treated with F_6 in the second cut, this trend was true only in the first season, while in the second one the highest leaf total potassium content (%)

was obtained in the second cut when the plants was sown in the summer and treated with F_6

V- 3-7- Leaf total carbohydrates content (%):

In both seasons of this study it was found that the richest leaf total carbohydrates content (%) was obtained in the second cut when the plants of *Tanacetum vulgare.* was sown in the summer and treated with the recommended dose F_1 (Ammonium sulphate 450 kg /fed).

V- 3-8 chlorophyll (a) content (mg/g.F.W):

It was found that sown *Tanacetum vulgare.* plants in the summer or winter and fertilized with F6 (Biofertilizer + Ammonium sulphate 300 kg /fed + 2ton compost/fed) and F7 (Biofertilizer + 10 m^3Biogas manure/fed.) showed to be the most effective treatments for producing the richest leaf chlorophyll (A) content (mg/g.F.W) in the first and second cuts in both seasons of this study.

V- 3-9- Chlorophyll (b) content (mg/g.F.W):

It was found that sown *Tanacetum vulgare* plants in the summer and fertilized with F_6 and F_7 showed to be the most effective treatments for producing the richest leaf chlorophyll (B) content (mg/g.F.W) in the first and second cuts in both seasons of this study.

V- 3-10- Leaf total chlorophyll content (mg/g.F.W):

It was found that sown *Tanacetum vulgare.* plants in the summer and fertilized with F_6 and F_7 showed to be the most

effective treatments for producing the richest leaf total chlorophyll content (mg/g.F.W) in the first and second cuts in both seasons of this study.

V- 3-11- Leaf total carotenoids content (mg/g.F.W):

In the first season, it was found that the greatest leaf total carotenoids content (mg/g.F.W) was obtained by sowing the plants of *Tanacetum vulgare*. in the summer and treated with F_5 and F_4 in both cuts, while in the second season sown the seeds in the summer and treated with F_3 and F_4 showed to be the most effective treatments for inducing the greatest leaf total carotenoids content (mg/g.F.W) in the second cut.