Studies on certain piercing-sucking insects infesting some vegetable crops

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The present work was conduct during 2002/2003 and 2003/2004 seasons to survey some of homopterous insects (whitefly, leafhoppers and aphids) infesting certain Cucurbitaceous, Solanaceous and Cruciferous crops during summer plantation (Squash, Pepper and Eggplant) and winter plantation (Cabbage and Cauliflower) in El — Mohamadia village , Minia El — Kamh district, Sharkia Governorate, Egypt. The seasonal abundance of the aforementioned dominate species and the ability of Circulifer tenellus to transmit beet curly top virus were also studied .These insects pests were collected by different methods from Cucurbitaceous, Solanaceous and Cruciferous plants under field condition . For this purpose the plant samples , sweeping net and yellow stick board traps were used . Results showed that the plant samples proved to be the best method to collect all the aphid species and whitefly also the sweeping net proved to be the best method to collect all the leafhopper species .295-Survey studies could be summarized as follows :a)Whitefly (Fam : Aleyrodidae)Whitefly Bemisia tabaci (Genn) was collected from the aforementioned vegetable plants with high numbers throughout the two seasons of investigation.b)Leafhoppers (Fam : Cicadellidae) 1- Squash plants.The following leafhopper species were collected from squash plants Empoasca decipiens (Paoli) , Empoasca decedens (Paoli) and Baklutha hortensis (Lindb) .2-Pepper plants .The following leafhopper species were collected from pepper plants Empoasca decipiens (Paoli), Empoasca decedens (Paoli), Cicadulina chinai (Ghauri) and Circuli rr tenellus(Baker).3-Eggplant plants.The following leafhopper species were collected from eggplant plants Empoasca decipiens (Paoli), Empoasco decedens (Paoli), Cicadulina chinai (Ghauri) and Empoasca ybica (de Berg).4-Cabbage plants .The following leafhopper species were colleted from cabbage plants Empoasca decipiens (paoli), Empoasco decedens (paoli) Balclutha hortensis (Lindb). 5-Cauliflower plantsThe following leafhopper species were colle ted from cabbage plants Empoasca decipiens (Paoli), Empoasc' decedens (Paoli)13alclutha hortensis (Lindb). c) Aphids (Fam : Aphididae)Aphis gossypii (Glover) was collected from squd plants , Brevicoryne brassicae (Linnaeus) and Myzus persi, ae (Sulz) were collected from cabbage and cauliflower plants .296- Seasonal abundance of dominant homopterous insect species infesting the aforementioned Cucurbitaceous, Solanaceous and Cruciferous vegetable plants can be summarized as follows :a) WhiteflyThree peaks were recorded on squash plants at 3rd week of April, at the end of May and 3rd week of June .On pepper plants two peaks were recorded at the 2nd week of June and l st week of September.Three peaks were recorded on eggplant plants at the 2" week of June , the 4th week of July and the 4th week of August.On cabbage plants three peaks were recorded at the 3rd week of October, at the 2nd of January and the 1st week of March.It has three peak recorded in the 3rd week of October, 2nd week of January and at the end of February on cauliflower plants. It is worthy to mention that the peaks of population density of B. tabaci adults were always detected over 1-2 weeks than those of immature stages .On squash plants three peaks of adult stage were recorded at the first week of May , and June and the first week of July . Two peaks were recorded on Pepper at 4th week of June and 31'd week of September. On eggplant plants three peaks were recorded at zith weeks of June, 2" week of August and second week of September. On cabbage plants four peaks were recorded at second weak of October in the lst week of November, in the 4th of January and second week of March .Four peaks were recorded on cauliflower at 2" week of October, in the first week of November, in the 4th

of January and the fourth peak occurred in the 2” of March.b) LeafhoppersI- Empoasca decipiens (Paoli.)One peak was recorded on squash plants at the third week of June . Two peaks occurred on pepper plants at the 3rd week of July and 3rd week of September. Two peaks also occurred on297 Summaryeggplant plants at 3rd week of July and 3rd week of eptember . On cabbage plants , it has two peaks at 4th week of ctober and the end week of January. Two peaks were r corded on cauliflower plants at the end of October and in the 4th week of January .2-Empoasca decedens (Paoli.)1t has one peak recorded on squash plants at the rd week of June . two peaks were recorded on pepper plants at rd week of July and 3rd week of September. One peak recorded o eggplants at 2” week of August. One peak occurred on cabba e plants at second week of November. One .peak recorded on cauliflower plants at mid November.3-Balclutha hortensis (Lindb.)Two peaks occurred on squash plants at the end week of April and June. One peak was recorded on cabba e plants at second week of October. Three peaks were r corded on cauliflower plants at the mid of October, (mid and 1St week of December) and (end and 3rd week of January) .4-Cicadulina chinai (Ghauri)It has one peak recorded at the first of August on pepper plants and at the third week of September on eggplant plants.5-Empoasca Lybica (de Berg)Two peaks were recorded on eggplant plants at the 3rd week of July and 3rd of September .c) Aphids1- Aphis gossypii (Glover)On squash plants , one peak of A. gossypii was recorded at the end of April .2-Brevicoryne brassicae (Linnaeus) .On cabbage plants four peaks were recorded at the mid of October, (at the first week of December and end week of November), at the mid week of February and at the 3rd week of March .Three peaks were recorded on cauliflower plants , at mid week of October, the end week of November and in the 3rd week of March .3-Myzus Persicae (Sulz.)Two peaks were recorded on cabbage plants at the mid week of October and 3rd week of March. Three peaks were recorded on cauliflower plants at mid of October, end of November and at the 3rd week of March .299- Effect of certain climatic factors (Maximum temperature, minimum temperature and relative humidity) on the population density of dominant homopterous insects infesting some Cucurbitaceous, Solanaceous and Cruciferous vegetable plants .Effects of the maximum temperature, minimum temperature and relative humidity on the population density and the abundance of whiteflies, leafhoppers and Aphids species infesting certain Cucurbitaceous, Solanaceous and Cruciferous vegetable plants (squash, pepper, eggplant, cabbage and cauliflower) were studied under field conditions. the results clearly indicated that significant and insignificant correlation coefficient and the partial regression were obtained between number of different insects species, maximum temperature,299 Summaryminimum temperature and relative humidity during the two investigation seasons .300- Effect of certain agriculture practices on population density of certain insects (Whitefly, Leafh ppers andAphids) .1- Squasha) Varieties1-Insect populationEscandarani variety proved to be the least sus ptible host for insects (Whitefly , Leafhoppers and Aphid) infestation, followed by Amco star while the Top kapi variety ap eared to be the most susceptible squash varieties.2-Mean yieldv2 (Escandarani) yielded the highest average in 2002 and 2003 seasons , followed by v I (Amco star) while v (top kapi) yielded the lowest average .b) FertilizationI- Insect populationThe highest mean number of insects per sami le occurred with control (without potassium fertilization) whereas the lowest population density of these insects recorded with 200 kg of potassium / feddan . Other treatments had a moderate position between the two aforementioned ones .2- Mean yieldThe highest yield was recorded with f3 (200 k feddan of potassium fertilization) in 2002 and 2003 seasons , ereas , the lowest yield were obtained in case of f4 (cont of withoutpotassium fertilization) during the first and second seasons , the other tested treatments gave a moderate yield .2- Peppera) Varieties1-Insect populationIt was obvious that in the two seasons of study cultivars v1 (Anaheium) proved to be least susceptible host plant or insects (Whitefly and leafhoppers) infestation while the variety v3 (Yellow wonder) appeared to be the most susceptible pepper variety and v2 (Marconi) recorded intermediate rank of infestation in two seasons.2-Mean yieldv 1 (Anaheium) yielded the highest average in 2002 and 2003 seasons , followed by v2 (Marconi) while v I (yellow wander) yielded the lowest average.b) Fertilization1-Insect populationThe highest mean numbers of insects per sample occurred on the f4 (control without potassium fertilization) during two seasons , whereas the lowest mean number was recorded with f3 (200 kg of potassium fertilization) treatment in the first and second seasons .2-Mean yieldThe

highest yield was recorded with f3 (200 kg of potassium fertilization / feddan) in 2002 and 2003 seasons, whereas, the lowest yield were obtained in case of f4 (without potassiumfertilization) during the first and second seasons, the other tested treatments gave a moderate yield .3- Eggplanta) Varieties1-Insect populationIt was obvious that in the two seasons of study ultivars v3 longpurple proved to be the least susceptible hos plant for insects (Whitefly and Leafhoppers) infestation, while the variety v I (Black beauty) appeared to be the most susceptib e Eggplant variety .2-Mean yieldv3 (long purple) yielded the highest mean in 200 and 2003 seasons, respectively , followed by v2 (white Baladi) cultivars , while v 1 (Black beauty) yielded the lowest mean n the two seasons.b) Fertilization1-Insect populationIn both seasons of study, F3 (200 kg / feddanpotassiumlertilization) proved to be the most effective against the insects (Whitefly and leafhoppers) development . The highest levels of insects abundance were recorded when eggplant plants were fertilized without potassium fertilization in both se ons . The other treatment gave a moderate degree of insect infest tion.2-Mean yieldThe highest yield was recorded with f3 (200 k / feddan potassium fertilization) in 2002 and 2003 seasons, whereas, thelowest yield were obtained in case of f4 (control) during the first and second seasons, the other tested treatments gave a moderate yield .4- Cabbagea) Varieties1-Insect populationThe most susceptible variety was v3 (Copenhagen) in both seasons. whereas v 1 (Baladi) was the least susceptible host plant for insects (whitefly, leafhoppers and aphids) infestation while, v2 (Brunswick) recorded intermediate rank of infestation .2-Mean yieldvl(Baladi) yielded the highest average in 2002/2003 and 2003/2004 seasons , followed by v2 (Brunswick) while v3 (Cobenhagen) yielded the lowest average .b) Fertilization1-Insect populationf4 (Control without potassium fertilization) plants showed a relatively high degree of susceptibility to insects (whitefly, leafhoppers and Aphids) invasion as compared to other fertilizers, this indicated that fl (50 kg /feddan potassium fertilization), 12 (100 kg/ feddan potassium fertilization) and f3 (200 kg / feddan potassium fertilization) increase the relative resistance of plants against insects attack2-Mean yieldThe highest yield was recorded with f3 and 12 (200, 100 kg / feddan potassium fertilization) in 2002/2003 and 2003/2004303 ,S'unutiaryseasons, whereas, the lowest yield were obtained i case of f4 (control without potassium fertilization) during the first and thesecond seasons, the other tested treatment gave a moderate yielded .5- Cauliflowera) Varieties1-Insect populationIt was obvious that in the two season of study cultivars v I (Sultani) proved to be the most susceptible host plant for insects (Whitetly, leafhoppers and Aphids) infestation while the variety v3 (Snowball) appeared to be the least susceptible cauliflower variety in both 2002/2003 and 2003/2004 seasons, while v2 (Original) recorded intermediate rank of infestation.2-Mean yieldv3(Snowball) yielded the highest mean in 2002/2003 and2003/2004 seasons , followed by v2 (Original) and vl (Sultani) varieties.b) Fertilization1- Insect populationIn both season, the f4 (200 kg / feddan potassium fertilization) proved to be the most effective against the insects (whitefly, leafhoppers and Aphids) infestation. The highest levels of insects abundance were recorded in case of f4 (control)in both seasons. The other treatments gave a moderate degree of insect infestation .2- Mean yieldThe highest yield was recorded with f3 (200 kg / feddan potassium fertilization) in both seasons. whereas, the lowest yield was obtained in case of f4 (Control without potassium fertilization) during the first and second seasons. The other tested treatments gave a moderate yield .305- Effect of chemical contents of fertilized plants (Squash, Pepper, Eggplant ,Cabbage and Cauliflower) on insects infestation .I- Protein'['he results obtained revealed positive correlation between potassium fertilization levels and protein content in all plants (squash, pepper, eggplant, cabbage and cauliflower) while negative correlation between protein content and insects infestation was recorded .2- CarbohydratePositive correlation was found between potassium fertilization levels and carbohydrate content , while negative correlation was recorded between carbohydrate content and insects infestation .3 - PH valueThere was partial correlation between PH value and potassium fertilization levels, while negative correlation was found between PH value and insects infestation .4- Calcium , Phosphorous and potassiumThere was non significant changes in calcium phosphorous and potassium by increasing potassium fertilization levels .VI-Effect of potassium fertilization on epidermal plant cell thicknessThe results revealed that increasing the potassium doses resulted in considerable increase in the thickness of epidermal plant cells which markedly reduced the total number of whiteflies , leafhoppers and Aphids

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