

THE EFFICACY OF SOME CULTIVARS AND MEDICINAL PLANT EXTRACTS ON GROWTH, PRODUCTIVITY AND CONTROL OF (*Spodoptera littoralis*) BOSID ON SWEET POTATO PLANTS.

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ABSTRACT

This study was conducted at Horticulture Research Station of El- Baramon, Dakahlia Governorate in both seasons (2007/2008 and 2008/ 2009) to study the effect of six spraying treatments with some aromatic of plant extracts. Namely ethanol extract of Thyme (T₁), aqueous extract of Thyme (T₂), ethanol extract of Basil (T₃), aqueous extract of Basil (T₄), ethanol extract of Lavender (T₅), and aqueous extract of Lavender (T₆) on the control of *Spodoptera littoarlis* and plant growth, yield and its component of three sweet potato cultivars "American 93", "Beure Gard" and "Abeese". The activity of some plant extracts against the cotton leaf worm was evaluated and expressed as the reduction in worm infestation by applying three spraying applications with an interval of a month during the two summer seasons of 2008 and 2009. The water extracts of a defected result in both season and the "Abeese" was the lowest infestation.

Regarding the effect of cultivars on growth parameters data showed that "Abeese" significantly produced higher leaf area, total and marketable yields, average fresh weight tuber root and tuber dry matter percentage compared with the other two cultivars. While "American 93" exceeded the other two cultivars in number of leaves and branches, main stem length and starch percentage in tuber in both seasons. Data revealed that the canopy dry weight per plant was higher in "Beure Gard" as compared with two cultivars. In general, results indicated that the aqueous extract of basil increased significantly all growth parameters, i, e, leaf area, number of leaves and branches and main stem length, yield and its component (total yield, marketable yield, and average fresh weight of tuber root) and dry matter percentage of tuber root, compared with other treatments applications. In this respect, results showed that "Abeese" plants treated with the aqueous extract of basil gave the highest values in all growth characters, yield and its component and dry matter percentage of tuber root.

The combined treatments of cultivars and plant extracts generally were more effective with using the aqueous extract of basil on "Abeese" where this combination showed the highest values of leaf area, yield and its component and tuber root dry matter percentage, while the same extract increased number of leaves per plant, main stem length (cm) and starch percentage when it was used an "American 93" plants. Finally, it is recommended that the "Abeese" plants treated with the aqueous extract Basil produced the highest values of plant growth, yield and its component, dry matter and showed the lowest infestation of *Spodoptera littoralis*

INTRODUCTION

Sweet potato (*Ipomoea batistes* L.) is one of the most popular sources of energy food in Egypt .It is widely used as a human food for pored start,

fodder livestock and also as a raw material for many industries, such as sweet potato flour, starch, alcohol and others. The root tubers are an important source of carbohydrates, rich in Vitamin C and A (Ergurra, 1982). Selection new sweet potato cultivars or clones for different purposes characterized with high yield and best quality.

Cultivars differ in their vigor's of vegetative growth, color of root skin and flesh, time of maturity, texture of the cooked roots and their contents of sugars, starch, carotene and minerals. In this regard, several investigators reported that vegetative growth of sweet potato cultivars varied according to the genotypes (Hegde *et al.*, 1986, Walker *et al.*, 1989).

Moreover, Somda and Kays (1990) mentioned that number of leaves and branches per plant and distribution of leaves on the branches were affected by sweet potato cultivars. EL-Shimi (1996) stated that "Mabrouka" produced the highest fresh weight of plant, vein followed by clone 925, while clone 1135 produced the lowest fresh weight. Tuber roots yield of sweet potato was found to be influenced by cultivars as mentioned by Harper and Walker (1985), Vasoncellos *et al.* (1986) and Ekanayake *et al.* (1990). In addition Hill *et al.* (1990) dealing with sweet potato, namely, i.e clones, TIS 8504, TIS 844 , TIS 70357 and TIS 2498, found that the produced average yield ranged from 20 to 38 ton /ha. In another study, Bertoi *et al.* (1994), in evaluation trials for different cultivars and clones of sweet potato, obtained tuber root yield ranged from 26.8-33.8 ton /ha. Newly cultivars were introduced to provide the market with good quality, quantity and resistances to *Spodoptera littoralis* Boisid, which is the second destructive pest to sweet potato leaves.

At the same time the use of chemical insecticides are not safe for animals on which feed the leaves as fodder, to avoid the hazards caused to the environmental due to the repeated spray of traditional chemical insecticides. It is necessary to find natural products as plant extracts to avoid pulation of environment EL-Sayed (1982) and Yacoub *et al.* (2010). The aim of this work was to study the effect of using plant aromatic extracts on vegetative growth parameters, yield and its components of some sweet potato cultivars and on the reducing the population of *Spodoptera littoralis* Boisid.

MATERIAL AND METHODS

Plot location and experimental design.

The study was conducted at Baramon Research Station, Horticultural Research Institute Mansoura Governorate. Three sweet potato cultivars were studied during the two growing seasons (April- September) of 2008 and 2009.

Plant extract.

Family Labiates contains some natural antioxidants, vitamins and some aroma components (Economou *et al.* 1991, and Lee *et al.* 2005). Three aromatic plants were chosen; belong to this family, to test their influence on *Sp.littoralis* population in field. Aqueous and ethanol extractions of Thyme (*Thymus vulgaris* L.), Basil (*Ocimum basilicum* L.) and Lavender (*Lavandula intermedia*) obtained from Medicinal and Aromatic plants Dep. Hort. Res. Inst.

Were used as a foliar application on sweet potato plants of the different solutions (500 ppm) three sprays were used to prevent the infestation with Spodoptera, starting a month after planting and a month interval.

Experimental treatments.

Each cultivar was sprayed with one of the following 7 solutions as follow:

- T₁ ethanol extract of Thyme.
- T₂ aqueous extract of Thyme.
- T₃ ethanol extract of Basil.
- T₄ aqueous extract of Basil.
- T₅ ethanol extracts of Lavender.
- T₆ aqueous extracts of Lavender.
- Water (control the untreated treatment).

The experimental design.

The experimental design was split plot. Cultivars represented the main plot, whereas, the spraying applications represented the sub plots (7 treatments). The plot area was 15 m², and contained 4 rows (5 m length, and 75 cm width). The cutting of the sweet potato cultivars ("Abeese", "Beure Gard", and "American 93") were planted at a distance of 25 cm between cuttings. All the normal agricultural practices were applied

Data recorded:

Growth parameters.

Data were recorded after 100 day from planting. A random sample of 3 plants was picked from each sub-plot treatment to record the following data:

- 1- Main stem length/plant (cm).
- 2 - Number of branches/plant.
- 3- Number of leaves/plant.
- 4- Leaf area (cm²) according to Watson (1952) formula.
- 5- Canopy dry weight/plant (g)

Yield and its components.

Total yield of tubers expressed as ton/fed. was recorded for each treatment at harvest after 130 days from planting. Thereafter, marketable tuber roots were isolated to determine the marketable yield ton/fed. and tuber roots fresh weight (g). The average tuber root weights were recorded on 5 healthy roots.

Chemical components.

Ten tuber roots were randomly chosen from each plot and the tuber roots samples were oven dried at 70 °C till a constant weight then the dry samples were used to determine the following:

- 1- Dry matter percentage using the methods described by A.O.A.C (1980).
- 2- Starch percentage was determined according to the method reported by Nelson (1974).

Pest estimation:

A five leaves sample was picked up randomly from each treatment (sub plot), one, three, five and seven days after the spraying. Number of larvae was recorded in 100 g each same taken sample.

Data analysis.

Data were statistically analyzed for variance using MSTSTC software; the mean values were compared at 5% levels of LSD as described by Snedecor and Cochran (1980).

RESULTS AND DISCUSSION

Pest estimation.

Data in Tables 1 and 2 showed the reduction percentage of larvae number after each application on each cultivar. The highest reduction was recorded during the first season for "Abeese" treated with the aqueous extract of Basil (T₄) after the 2nd application (97.65%) followed by "American 93" treated with the ethanol extract of Thyme (T₁) or T₄ and "Beure Gard" treated with the ethanol extract of Thyme (T₂) or aqueous extract of Lavender (T₅), after the 3rd application giving 96.38% reduction for all. In contrast, the lowest percentage was recorded on these sprayed with T₅ after the third application (62.5%).

Table 1: Effect of some plant extracts on the reduction of percentage (%) Spodoptera larvae during summers season (May-Sept.) of 2008 on three sweet potato cultivars after three spraying applications.

Cultivars Date Treatments	"Abeese"			"Amer."			"Beu."		
	1 ^{rst}	2 nd	3 rd	1 ^{rst}	2 nd	3 rd	1 ^{rst}	2 nd	3 rd
T ₁	79.79	71.76	91.07	68.92	70.78	96.38	74.07	81.91	86.75
T ₂	82.85	77.64	89.28	85.13	77.53	87.95	88.88	81.91	96.38
T ₃	82.82	69.42	89.28	81.08	78.65	90.36	72.22	81.91	92.77
T ₄	87.87	97.62	85.71	87.83	80.89	96.38	85.18	79.78	92.77
T ₅	89.89	91.65	62.51	87.83	80.89	86.75	87.18	84.04	96.38
T ₆	91.91	91.76	92.85	81.08	76.40	93.97	81.48	84.04	91.56

Table 2: Effect of some plant extracts on the reduction percentage (%) of Spodoptera larvae during summer season (May-Sept.) of 2009 on three sweet potato cultivars after of three spraying applications.

Cultivars Date Treatments	"Abeese"			"Amer."			"Beu."		
	1 ^{rst}	2 nd	3 rd	1 ^{rst}	2 nd	3 rd	1 ^{rst}	2 nd	3 rd
T ₁	65.85	69.23	68.08	86.75	69.44	77.03	70.31	70.88	72.29
T ₂	78.00	61.54	59.57	84.34	76.38	77.03	75.00	69.62	77.11
T ₃	75.61	76.92	68.08	89.15	65.27	75.67	75.00	72.15	80.72
T ₄	68.29	59.61	68.08	81.93	63.88	77.03	71.87	75.95	80.72
T ₅	68.29	61.54	76.21	80.72	63.88	76.31	78.12	68.35	72.29
T ₆	70.07	67.31	68.08	83.13	68.05	79.73	73.44	70.88	78.31

During the second season, the highest percentage was recorded in the first application on "American 93" sprayed with the ethanol extract of Basil T₃ (89.15%). On the contrary, the lowest reduction (%) was recorded on

"Abeese" sprayed with T₂, after the third application, giving a value of 59.57%.

As shown in Table 3, "Beure Gard" had significantly the lowest population of *S. littoralis* in the first season, while these results were obtained by "Abeese" in the second season. Such trend was observed on the three different cultivars when they were effect without treatment.

Table 3: Effect of some plant extracts on the average population of podoptera larvae (larvae/5 leaves) on three sweet potato cultivars after three spraying application during two successive second seasons (May- Sept.) of 2008 and 2009.

Cultivars Date Treatment	1 st season				2 nd season			
	"Abeese"	"Amer."	"Beu."	Mains	"Abeese"	"Amer."	"Beu."	Main
T1	16.32	17.32	13.32	15.65	14.99	16.66	21.65	17.98
T2	12.99	13.66	8.66	11.77	16.32	16.55	20.99	17.76
T3	16.66	13.66	12.66	14.33	12.33	17.32	17.66	17.55
T4	13.66	9.32	8.65	10.54	16.33	18.33	17.99	15.77
T5	12.65	12.32	8.32	11.09	15.66	19.32	20.32	16.76
T6	11.00	13.33	10.66	11.66	13.66	17.32	19.32	18.43
check	79.99	81.99	76.98	79.65	46.66	76.32	76.32	66.43
Mean	21.75	21.51	19.89		19.41	23.54	27.32	
LSD	1.16				0.65			
LSD	0.48				0.54			
LSD	0.84				0.93			

There results may be attributed to the interaction effects among weather condition, the insects and cultivars. Data presented in the same Table clearly indicated that plants treated with T₄ showed the lowest infestation with the larvae followed by these treated with T₅ in both seasons. These results may be attributed to the odour effect of the extraction of Basil and Lavender which cause repellent to the larvae and ales changed the leaves to be non palatable to feed on.

Generally water extracts of Basil and Thyme were more effective in reducing the population of larvae on sweet potato plants than the ethanol extracts (Table 3). The obtained results in this study are in harmony with that obtained by Awadallah *et al* (1984) and Yacoub *et al*(2010) who mentioned that the water extract of some plant were great influence on *Sesemia cretica* infestating maize. Also Yacoub (2010) confirm that the lemongrass and green Durante water extract were of high influence on the reduction of egg number of pink stem borers in maize (water extract than pert. and acetone) while the green Durante water extract affected the larvae population.

Vegetative growth.

Effect of cultivars.

"Abeese" showed significant increases in leaf area in two seasons as compared to the other cultivars (Table 4). On the other hand, "American 93" showed higher values of leaves number/plant and main stem length, in the two seasons, as well as higher number of branches per plant, in the first season, as compared to "Beure Gard" and "Abeese". These variations could

be due to the genetically condition of three cultivars under this study. Similar these results were reported by EL-Shimi, (1996) and Hewedy, *et al.* (1999).

Table 4: Effect of cultivars and some medicinal plants extracts on vegetative growth parameters of sweet potato Plants the summer seasons of 2008 and 2009

Treatments	Leaf area (cm ²)		Leaves No./plant		Branches No./plant		Main stem length (cm)	
	2008	2009	2008	2009	2008	2009	2008	2009
Cultivars								
American 93	375.69	379.12	100.3	108.33	14.13	15.26	155.84	158.03
Beure Gard	418.55	449.90	94.76	102.61	13.19	15.25	141.34	148.71
Abeese	457.22	515.56	91.42	100.00	12.87	15.20	128.10	132.47
LSD 0.05%	11.66	1.02	5.46	1.51	0.55	N.S	2.26	1.51
Spraying Treat.								
Control	392.57	407.72	85.88	87.55	10.95	13.82	133.44	136.78
T₁	414.73	447.83	95.33	93.66	13.06	15.20	138.42	147.26
T₂	428.61	475.57	99.53	109.66	14.95	15.73	148.60	150.10
T₃	399.00	418.96	100.30	100.00	11.60	14.86	138.73	143.98
T₄	444.13	490.90	104.00	118.00	15.48	16.40	149.73	153.16
T₅	432.23	461.36	100.30	112.33	14.37	15.66	145.94	149.96
T₆	409.26	435.04	93.66	104.33	13.35	15.00	138.47	143.63
LSD 0.05%	12.00	3.82	4.04	4.33	1.48	0.69	2.25	3.76

Effect of medicinal plant extracts.

Regarding the effect of plant extracts (Table 4), the aqueous basil (T₄) increased significantly all vegetative parameters, i, e, leaf area, leaves number per plant, branches number per plant and main stem length compared with control and other treatments under this study. These results may be attributed to the lower population of larvae recorded on sweet potato plants treated with the aqueous solution of basil. Also, the aqueous basil may be containing some vitamins and antioxidant which simulate the plant metabolism and photosynthesis that led to highly increases in vegetative growth. In this respect, Mady (2009) indicated that the tomato plants sprayed with salicylic acid and vitamin E caused increases significantly in all growth parameters. Similar findings were reported by Abd El-Fattah and Arisha (2000) on Common bean, and Arisha (2000)^a on pea.

Effect of the interaction between cultivars and medicinal plant extracts.

Data in Table 5 clearly indicated that "Abeese" plants treated with aqueous basil, significantly showed greater leaf area than any treatment in two seasons, while "American 93" plants sprayed with aqueous basil had significantly the highest number of leaves and branches and was the length main stem during two seasons.

Yeild and its components.

Effect of cultivars.

Results presented in Table 6 showed that "Abeese" produced higher in total yield per fed⁻¹., marketable yield per fed⁻¹ and average tuber fresh weight than the other two cultivars in both seasons. On the contrary, the lowest values of total, marketable yield per fed⁻¹ and average fresh weight of tuber were obtained by using "American". The superiority could be attributed to the

varietal differences among three cultivars. The differences in productivity among "American 93", "Beure Gard" and "Abeese" cultivars could be explained based on the genetic differences among the three cultivars. Obtained results are in harmony with those reported by Abd- El-salam (1993), Acedo *et al.* (1996), El-Shimi (1996), and Hewedy *et al.* (1999).

Table 5: Effect of the interactions between cultivars and some medicinal plants vegetative parameters on sweet potato plants in the summer seasons of 2008 and 2009.

Treatments	Leaf area (cm ²)		Leaves No./plant		Branches No./plant		Main stem (cm)	
	2008	2009	2008	2009	2008	2009	2008	2009
American 93*Spraying treat.								
Control	352.14	330.80	84.33	92.33	11.73	13.46	149.03	139.76
T ₁	370.20	381.80	100.00	100.00	13.66	15.00	153.40	160.10
T ₂	382.40	411.10	105.00	113.00	15.26	15.60	160.60	165.10
T ₃	355.50	338.90	94.00	106.00	12.00	14.80	152.96	156.70
T ₄	396.10	422.70	113.00	120.00	16.06	17.40	162.43	168.80
T ₅	410.83	397.70	106.00	114.00	15.33	15.80	160.10	163.70
T ₆	362.70	370.90	100.00	113.00	14.86	14.80	152.40	151.90
Beure Gard*Spraying								
Control	404.60	405.20	85.33	85.33	10.93	13.80	128.6	143.9
T ₁	413.50	451.30	96.00	88.00	12.00	15.40	138.40	148.30
T ₂	429.50	482.31	100.00	116.00	15.00	16.00	148.10	149.80
T ₃	410.30	417.60	90.00	96.00	12.33	14.80	141.46	146.23
T ₄	441.20	501.30	101.00	118.00	15.40	16.00	148.90	154.11
T ₅	418.96	460.90	100.00	115.00	14.46	15.60	144.86	151.7
T ₆	411.80	430.63	91.00	100.00	12.2	15.20	139	147.00
Abeese* Spraying treat.								
Control	420.96	487.16	88.00	85.00	10.20	14.20	119.63	126.7
T ₁	460.50	510.40	90.00	93.00	13.53	15.20	123.46	133.40
T ₂	472.60	533.30	93.00	100.00	14.60	15.60	137.11	135.10
T ₃	431.20	500.40	86.00	98.00	10.46	15.00	122.33	129.03
T ₄	495.10	548.60	98.00	116.00	15.00	15.80	137.86	136.03
T ₅	466.90	525.50	95.00	108.00	13.33	15.60	132.86	134.5
T ₆	453.30	503.60	90.00	100.00	13.00	15.00	123.46	132.00
LSD.0ss.05%	20.78	6.61	7.00	7.45	2.54	1.20	3.92	6.59

Effect of plant extracts.

Data in Table 6 revealed that plants got the aqueous basil produced the highest values of total, marketable yield and average fresh weight of tuber compared with the other applications during two seasons, in addition, the aqueous basil application produced the highest fresh vines. This could be due to the relationship between the vegetative growth and yield parameters. Also, Arisha (2000)^b found that foliar application with vitamin C increased total yield of potato tubers. Similar opinio were reported by Mady (2009) in Tomato. In addition the chemical component of basil extracts such as vitamins and antioxidant, might improved the quality of tubers. This results are in agreement with Abd El-Fattah and Arisha (2000) in Common bean, and Arisha (2000)^a on Pea.

Table 6: Effect of cultivars and spraying of some medicinal plant extracts on total, marketable yield and tuber fresh weight of sweet potato plants in the summer seasons of 2008 and 2009

Treatments	Total yield (ton/fed)		Marketable yield (ton/fed)		Tuber root fresh weight (g)	
	2008	2009	2008	2009	2008	2009
Cultivars						
American 93	11.66	12.69	11.16	12.23	129.52	145.04
Beure Gard	12.32	13.71	11.82	13.27	138.28	150.57
Abeese	14.62	15.09	14.24	14.70	145.59	167.93
LSD 0.05%	0.13	0.07	0.17	0.07	0.81	0.75
Spraying Treat.						
Control	10.94	11.94	10.33	11.29	119.41	137.51
T₁	12.94	13.97	12.55	13.56	139.43	155.72
T₂	13.65	14.51	13.21	14.17	149.78	165.72
T₃	12.41	13.52	12.03	13.05	125.82	142.71
T₄	14.00	14.82	13.59	14.50	151.30	169.72
T₅	13.37	12.28	12.91	13.90	145.46	162.18
T₆	12.75	13.77	12.23	13.33	133.36	148.54
LSD 0.05%	0.20	0.14	0.24	0.13	1.35	5.95

Effect the interaction between cultivars and plant extracts.

Data presented in Table 7 showed that "Abeese" plants treated with basil or thyme aqueous extracts showed the highest values of total and marketable yield of tubers during two seasons, as compared to the other treatments. However, the same treatment significantly increased the average fresh weight of tuber only in first season. These results might be due to the increases in leaf area in "Abeese" plants that resulted higher tubers yield reported by EL-Banna and Haggag (2005) on Taro.

Canopy of dry weight per plant, dry matter of tubers and starch contents in tubers.

Effect of cultivar.

Results in Table 8 indicated that cv. Beure Gard showed higher canopy of dry weight per plant, than American 93 and Abeese. It expressed 170.12, 171.66 g in two seasons, respectively, whereas "American 93" and "Abeese" showed 150.49, 151.25 and 160.84, 162.08 g in two seasons, respectively. On the other hand, "Abeese" showed significantly higher dry matter of tuber root percentage (24.26, 23.74 % in two seasons, respectively) in comparison with "American 93" and "Beure Gard" which had 22.65, 22.25 and 22.21, 22.61% of dry matter in tuber roots in both seasons, respectively. Meanwhile, "American 93" produced tuber roots containing 16.96 %, 15.65% starch in two seasons, respectively, which was higher than those produced by "Beure Gard" and "Abeese".

These differences could be due to the genetic differences among the three cultivars. Similar conclusion was reported by Abd- El-salam (1993), Acedo *et al.* (1996), El-Shimi (1996), and Hewedy *et al.* (1999).

Table 7: Effect of the interaction between cultivars and medicinal plant extracts on total, marketable yield and tuber root fresh weight of sweet potato plants in summer season of 2008 and 2009.

Treatments	Total yield (ton/fed)		Marketable yield (ton/fed)		Tuber root fresh weight (g)	
	2008	2009	2008	2009	2008	2009
American 93*Spraying treat.						
Control	10.30	10.88	9.70	10.23	117.24	123.05
T ₁	11.77	12.80	11.27	12.35	130.21	147.19
T ₂	12.31	13.43	11.86	13.05	139.11	155.84
T ₃	11.06	12.28	10.51	11.78	119.16	136.36
T ₄	12.69	13.70	12.25	13.37	140.25	158.91
T ₅	12.06	13.18	11.6	12.77	134.35	153.77
T ₆	11.48	12.59	10.95	12.10	126.38	140.22
Beure Gard *Spraying treat.						
Control	10.42	12.07	9.85	11.04	118.77	131.44
T ₁	12.44	13.81	11.96	13.38	139.37	151.44
T ₂	13.13	14.33	12.69	13.98	150.11	161.11
T ₃	11.89	13.40	11.35	12.91	126.62	140.36
T ₄	13.42	14.65	13.00	14.34	153.33	164.81
T ₅	12.82	13.14	12.34	13.75	146.52	159.95
T ₆	12.11	13.59	11.59	13.13	133.28	144.88
Abeese*Spraying treat.						
Control	12.17	12.89	11.43	12.25	122.30	158.04
T ₁	14.40	15.30	14.44	14.96	148.73	167.02
T ₂	15.51	15.79	15.09	15.48	160.13	180.21
T ₃	14.30	14.87	14.24	14.47	130.14	151.43
T ₄	15.91	16.11	15.52	15.81	161.88	185.45
T ₅	15.24	15.51	14.80	15.19	155.51	172.84
T ₆	14.65	15.41	14.71	14.76	140.44	160.52
LSD 0.05%	0.35	0.241	0.418	0.24	0.68	N.S

Table 8: Effect of cultivars and some medicinal plant extracts on dry matter in leaves and tuber root and tuber root starch contents of sweet potato plants in the summer seasons of 2008 and 2009

Treatments	Canopy dry weight/ plant		Dry matter (%) in tuber root		Starch (%) in tuber root	
	2008	2009	2008	2009	2008	2009
Cultivars						
American 93	150.49	151.25	22.65	22.25	16.96	15.65
Beure Gard	170.124	171.66	22.21	22.61	14.06	14.12
Abeese	160.84	162.08	24.26	23.74	14.95	14.98
LSD 0.05%	2.87	5.11	1.09	1.02	0.20	0.20
Spraying Treat.						
Control	145.53	149.69	20.61	20.87	14.66	14.48
T ₁	159.26	168.24	23.72	23.06	14.69	15.33
T ₂	170.26	172.30	23.34	22.81	15.47	14.92
T ₃	157.90	161.74	23.00	23.17	14.47	14.82
T ₄	169.09	160.43	24.78	24.25	15.85	15.15
T ₅	165.17	163.53	23.00	22.93	15.15	15.03
T ₆	155.74	155.69	22.82	22.99	14.81	14.67
LSD 0.05%	1.24	7.06	1.24	1.06	0.17	0.41

Effect of plant extracts.

Table 8 also showed that plants treated with aqueous basil produced a higher canopy dry weight per plant (169.09, 160.74 g) and dry matter in tuber root (24.78, 24.25) in two seasons, respectively, as compared with the other treatments. In this respect, Arisha (2000) found that the simulatives effect of vitamin B₁₂ on dry weight of common bean plants might be due to that vit. B₁₂ noted to stimulate development of chloroplast and vegetative growth of bean plants, which in trun increased dry weight of plant. Moreover, plants received the aqueous basil showed highest values of starch content (15.85, 15.15%) in comparison with the other treatments sin two seasons, respectively.

Effect of interaction between cultivars and plant extracts.

Data in Table 9 indicated that, "Beure Gard" plants sprayed with the aqueous basil produced the highest significantly values of canopy dry weight per plant in first season. On the contrary, "Abeese" plants treated with the same basil extract showed the maximum values of dry matter percentage of tuber root in two seasons. On the other hand, "American 93" tuber roots produced higher content of starch percentage when their plants sprayed with the aqueous basil. This result was significant in second season.

Table 9: Effect of the interaction between cultivars and some medicinal plants extracts on dry matter (leaves and tuber) and tuber root starch contents of sweet potato plants in the summer seasons of 2008 and 2009

Treatments	Canopy dry weight/plant (g)		Dry matter (%) in tuber root		Starch (%) in tuber root	
	2008	2009	2008	2009	2008	2009
American 93*spraying treat.						
Control	139.05	178.83	20.61	20.45	11.73	14.75
T ₁	150.05	190.32	23.91	23.88	13.66	16.88
T ₂	158.90	200.11	23.15	22.35	15.26	15.17
T ₃	148.90	181.88	23.09	23.09	12.00	16.28
T ₄	157.81	201.45	23.63	22.95	16.06	15.49
T ₅	151.77	195.41	21.88	20.44	15.33	15.39
T ₆	146.99	187.72	22.28	22.65	14.86	15.57
Beure Gard*spraying treat.						
Control	153.93	185.88	20.67	21.74	10.93	14.07
T ₁	180.50	216.84	22.36	21.33	12.00	14.31
T ₂	167.95	203.11	22.85	22.56	15.00	14.33
T ₃	181.08	219.15	21.69	21.76	12.33	13.62
T ₄	165.50	190.25	24.16	24.66	15.40	14.79
T ₅	177.80	211.34	22.36	23.56	14.46	14.09
T ₆	164.09	199.67	21.37	22.66	12.20	13.62
Abeese*spraying treat.						
Control	143.61	204.33	20.57	20.43	10.20	14.63
T ₁	171.38	237.35	24.88	23.99	13.53	14.79
T ₂	161.15	222.37	24.03	23.44	14.60	15.27
T ₃	168.88	244.31	24.03	24.77	10.46	14.56
T ₄	159.30	208.83	26.59	25.17	15.00	15.19
T ₅	165.93	230.65	24.76	24.79	13.33	15.60
T ₆	156.14	217.11	24.80	23.66	13.00	14.83
LSD 0.05%	2.15	N.S	2.18	2.03	N.S	0.72

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دراسة تأثير مدى فاعلية استخدام الاصناف ومستخلصات بعض النباتات الطبية
على النمو والانتاجية ومكافحة دودة ورق القطن على نباتات البطاطا
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أجريت الدراسة بمحطة بحوث البساتين بالبرامون محافظة الدقهلية في موسمين متتاليين (٢٠٠٧/٢٠٠٨) و(٢٠٠٩/٢٠٠٨) وذلك لدراسة مدى إستجابة ثلاثة أصناف من البطاطا وهي الأمريكي ٩٣ , بيورجارد, أبيض لست إضافات من المستخلصات النباتية الاتية المستخلص الكحولي للزعر, المستخلص المائي للزعر, المستخلص الكحولي للريحان, المستخلص المائي للريحان, المستخلص الكحولي للافندر, المستخلص المائي للافندر, والكنترول (الغير معاملة) وتأثير ذلك على النمو, والمحصول ومكوناته , ومقاومة دودة ورق القطن على نباتات البطاطا.

وحيث تم تقييم فاعلية ست مستخلصات نباتية لمقاومة دودة ورق القطن كعامل تقليل الإصابة بالدودة من خلال ثلاث رشات في موسمين نمو (٢٠٠٩/٢٠٠٨) بين كل رشة وأخرى شهر وجد أن المستخلص المائي أعطى نتائج جيدة في كلا الموسمين , وكذلك كان الصنف أبيض أقل إصابة , بينما كان مستخلص الريحان المائي اعطى اقل تعداد لليرقات.

اما بالنسبة لتأثير الاصناف علي صفات النمو و الانتاجية أظهرت النتائج أن الصنف أبيض تفوق على الصنفين الاخرين في المساحة الورقية للنبات والمحصول الكلي والاقتصادي وكذلك الوزن الطازج للدرنة والمادة الجافة للدرنات ,بينما الصنف الأمريكي أظهر زيادة معنوية في عدد الاوراق و الافرع وطول الساق الرئيسية وكذلك في نسبة النشا.

اما بالنسبة لتأثير الرش بالمستخلصات النباتية أشارت النتائج إلى ان إضافة المستخلص المائي للريحان لنباتات البطاطا ادى إلى زيادة معنوية في الصفات الخضرية (المساحة الورقية, عدد الاوراق والافرع , وطول الساق الرئيسية) وكذلك أدى إلى زيادة المحصول الكلي والاقتصادي والوزن الطازج والمادة الجافة للدرنات, وزيادة نسبة النشا وذلك بمقارنته بالمستخلصات الاخرى المستخدمة .

بالنظر لتأثير التفاعل بين المعاملات نجد أن إضافة المستخلص المائي للريحان لنباتات الصنف أبيض كانت أكثر فاعلية في أغلب الصفات النمو والانتاجية.

وأخيرا , يمكن التوصية باستخدام الصنف أبيض مع الرش بالمحاليل المائية وخاصة الريحان وذلك لمقاومة دودة ورق القطن , وكذلك لما له من تأثير إيجابي على النمو والانتاجية.

قام بتحكيم البحث

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