

YIELD AND QUALITY OF NEWLY SELECTED CARROT (*Daucus carota* L) GENOTYPE UNDER MIDDLE EGYPT CONDITIONS

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ABSTRACT

This investigation was conducted at Mallawi Research station farm , Minia Governorate In 1999/2000 and 2000/2001 season. The soil type was silty - loam. Yield and quality of newly selected carrot (*Daucus carota* L) genotypes versus 20 other genotypes grown under Middle Egypt conditions were studied.

The newly selected purple carrot gave a high total leaves weight (ton / fed), biological yield (ton / fed.), average leaf length (cm) and average number of leaves per plant while it gave intermediate total root yield (ton/fed.), average root length (cm.), average top, middle and tip root diameter (cm), cortex and core diameter and root total soluble solids (T.S.S.). Skinkuro T.A, cv. gave a high total root yield (ton / fed.) and biological yield (ton / fed.) while Chantenay red cored gave the lowest value in total root yield (ton / fed.) and average root length Chantenay extra long gave a lowest biological yield (ton / fed.). Nandrin F1 and Nantuchet F1 cvs. gave the highest average root length (cm). and average top, middle and tip root diameter, while, Flakkeer regol and Laranda gave the lowest value. BCT 3802, Kohli 200 and Nandrin F1 gave the highest cortex thicken and core diameter, while Flakkeer regol gave the lowest value. Berlanda F1 and Chentenay extra long gave the highest percentage of T.S.S. however. Kazan F1 and Kamaran F1 gave the lowest value.

The correlation study showed that there was a high positive significant relation between weight leaves / length leaves, root weight / leaves weight and top root diameter / tip root diameter. However, the relation between root weight / root length was negative significantly.

INTRODUCTION

Carrot (*Daucus carota* L.) is an important and popular vegetable crop in the Egyptian diet. In Egypt the area cultivated with carrot crop was about 11757 feddans in 1998 yielding a total of 129450 tons, with an average of 11 tons / feddan*.

* Agricultural economics, Dept. of Statistics, Ministry of Agricultural (in Arabic, 1998).

The anthocyanin carrot was amongst the popular vegetables for both fresh marketing and processing. It has low productivity and low root quality, and it is easy to bolt. Because of little attention of research work on improving the productivity and root quality of this type of carrot an obvious deterioration in both yield and root have taken place. However, during the last 17 years efforts were made in the Dept. of Horticulture, University of Assiut to improve the productivity and quality of this type (Hussein, 1985 & 1993 and Rofael and Hussein 1998). In Germany (Schulz *et al.*, 2000) evaluated nine hybrid varieties of carrot (*Daucus carota*) and 3 seed cultivars under organic cultivation at Giessen in 1997-98. However, most organic farming

associations object to the use of hybrid varieties thus breeding efforts need to focus on true seed varieties, (Hussein *et al.*, 2000).

Balady purple selection average top, middle and tip root diameter, (after 120 days from planting) was 4.0, 2.9 and 1.1 cm, respectively. The color of root dark purple number of leaves was 11 leaves and leaf length 41 (cm) was obtained from Dr. K Abd EL-Azez. Dept. of Horticultural, Res. Inst. Agric. Doki. Giza

Bajaj *et al.* (1980) analyzed roots of 23 Indian and foreign carrot cultivars for chemical constituents and studied their physical properties. They found a wide variation in chemical constituents and plant characteristics i.e. root length, T.S.S. content.

Riad *et al.* (1981) evaluated 10 foreign varieties during the winter season. They studied the plant weight, root weight, top weight, top weight: root weight ratio, root length, core diameter total soluble solids (T.S.S.). Rouge Nantes (Red Nantes) exceeded all others in plant weight and root weight, Danvers 126 was the highest in T.S.S

Sazonoval (1986) found that carrot the most useful cvs. for production were those giving high yields at 80 – 100 plants /m², notably losinoostrovskaya 13 and Chantenay 2461, (yield was correlated with mean root weight).

Five cultivars were tested for total and commercial yields and average root weight (Brune *et al.*, 1988). The highest yielding cultivars were Tropical, Brasilia and Kuronan with commercial – grade root yields of 32.67, 28.15 and 26.57 t / ha respectively. The lowest yielding cultivar was Meio comprida de Nantes, giving 18.34 t / ha.

The yield and quality of 6 Hungarian and 2 imported cultivars were evaluated by Bujdoso and Hrakso (1988). Berlanda F1 produced the highest yield (64.7 t / ha) but had the lowest solids content (10.62%) Keeskemeti. A moderate correlation was found between root weight and length ($r = 0.64$). cv. Fortodi voros, because of its high solids (13.25%) had, however, the lowest yield.

Morphological parameters of roots, including length and width, were evaluated in 5 basic varieties of carrot in various soil and climatic conditions (Zufanek and Groda, 1988). Measurements indicated that the roots of different cultivars vary greatly in shape. A relationship was statistically determined between resistance to mechanical damage and root shape coefficient. as the results indicate, there is a comparatively constant relationship between the upper width of the root and its length.

Netra *et al.* (1993) compared Pusa Meghali and Pusa Kesar carrot cultivars in India and reported cultivar differences. Performance characteristics were root weight top, root ratio, root length, top length, and root diameter.

Taha (1994), found that Balady cv. gave higher values for total number of leaves, root length, root weight and total carrot root yield Chantenay cultivar gave higher values in T.S.S. and root / shoot ration than cv. Balady.

Jin Weiling *et al.* (2000). tested Xin Huluobu 1; a new carrot (*Daucus carota*) variety, selected from a natural hybrid progeny of a local variety. Its

fleshy orange – red out is cylindrical 14–16 cm long, 4.5 cm wide and 120 – 140 g in weight. The cuticula, texture and centrum all are orange – red it is suitable for fresh consumption and processing. The average yield is 64.5 t / h. The aim of the study was to compare 20 cultivars of carrot (*Daucus carota* L) with the newly purple selection for the yield and its quality under Middle Egypt conditions.

MATERIALS AND METHODS

This investigation was conducted at Mallawi Research Station Farm, Minia Governorate on 1999/2000 and 2000/2001 seasons. The soil type was silty clay loam. Twenty cultivars of carrot (*Daucus carota* L) were compared with the new purple selection for the yield and its quality under Middle Egypt conditions. (Table 1).

The 21 Cultivars were planted on rows of 3.5 m long and at 60 cm apart. Plot was consisted of five rows and has an area of 10.5 m² (1/400 fed.). The seeds were sown on October 11th in both sides of each row on both seasons. Cultivars were arranged in complete randomized block design with four replicates. Plants were thinned out one month after sowing to 3: 5 cm between plants.

Table (1) The tested cultivars and their sources

No	Cultivars	Source
1	Purple Selection	Deprt. Of Hort. Rec. Inst. Dohki
2	Chantenay red cored	Ohisens enke
3	Danvers 126	Eifacrostan
4	Skinkuro T.A.	H ungrong seed Co.
5	Nandrin F1	bezs
6	Kamaran F1	bezs
7	Amsterdammer sweet heart	bezs
8	Amsterdammer A.B.K.	bezs
9	Kazan F1	bezs
10	Balady local	Qena governorate
11	BCT 3820	Bio seed
12	Kikuys	Bio seed
13	Kohli 200	Bio seed
14	Nagano F1	bezs
15	Nantuchet F1	bezs
16	Napoli F1	bezs
17	Berlanda F1	bezs
18	Chantenay extra long	Bakker Brothers
19	Mokum F1	bezs
20	Laranda F1	bezs
21	Fiakkeer regdl	Ohisens enke

Other cultural practices of fertilization and irrigation for carrot production were followed as recommended for commercial filed conditions.

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Harvesting was carried out, when roots were matured, on the 8th February, in the first and second seasons

The following data were recorded:

- 1) Total root yield (ton / fed.): measured as weight of all roots per plot, then converted to weight of roots per feddan
- 2) Total leaves weight (ton / fed.): measured as the weight of all leaves per plot, then converted to weight of leaves per feddan.
- 3) Biological yield weight (ton / fed.): (Total root yield + total leaves yield).

Samples of 10 plants for each cultivars per each plot were randomly taken 2 days before harvesting from the outer rows; following guard rows; for determination of the following characters: -

- 4) Average root length (cm)
- 5) Average leaf length (cm).
- 6) Average number of leaves per plant.
- 7) Average top root diameter (cm).
- 8) Average middle root diameter (cm).
- 9) Average tip root diameter (cm).
- 10) Thicknen and core diameter.
- 11) Root total soluble solids percentage (T.S.S).

The following data were calculated:

- 12) Ratio between weight leaves / length leaves.
- 13) Ratio between root weight / root length.
- 14) Ratio between root weight / leaves weight.
- 15) Ratio between top root diameter / tip root diameter.
- 16) Taper coefficient (thickness ratio of the upper and lower parts of the root)
- 17) Potassium ,Calcium and dray matter percentage.

All data were subjected to statistical analysis and means were compared using L. S. D. test as revealed by (Gomez and Gomez, 1984).

RESULTS AND DISCUSSION

1) Total roots yield (ton / Fed.) :

Data for this character are presented in Table (2). Significant difference were found among the 21 cvs, Skinkuro T.A, gave the highest total root yield (11.36 – 12.00 ton / fed.) However, Chantenay extra long gave lowest record (6.30 and 8.25 ton / fed.) purple selection was intermediate (8.85 and 10.15 ton / fed.) Same results were reported by Taha (1994). In this study Chantenay red cored gave the best yields, and the Nantes strain Munkegared Osená was promising.

2) Total leaves weight (ton / fed.):

Data for this character, is presented in Table (2). Purple selection gave the highest leaves weight (5.90 ,6.10 ton / fed.), while chanteny extra long gave the lowest value (1.90 ,2.12 ton / fen.). Other cultivars were intermediate. Thaha (1994) indicated that Balady cv. gave a higher value of leaves weight.

3) Biological yield (ton / Fed.):

Results for this character are presented in Table (2), Skinkuro T.A and purple selection were top yielding cv. (15.16, 16.30 and 14.75, 16.25 ton / fed.) in the first and second seasons respectively. On the other hand, Chantenay extra long gave the lowest values (8.20 and 10.50 ton / fed.) in the first and second seasons respectively. Taha (1994) reported that Balady cv, gave the highest values of fresh weight and total root yield.

Table (2): Roots total yield (ton / fed.) leaves weight (ton/fed.) and biological yield (ton/fed.) of Purple selection as compared to carrot 20 genotypes grown under Middle Egypt conditions in 1999/2000 and 2000/2001 seasons.

Cultivar No	Root total yield ton/fed		Leaves weight ton ton/fed.		Biological ton / fed.	
	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001
1	8.85	10.15	5.90	6.10	14.75	16.25
2	9.49	10.20	3.17	3.40	12.65	13.60
3	9.68	9.62	3.20	2.88	12.87	12.50
4	11.36	12.00	3.80	4.30	15.16	16.30
5	10.41	10.32	3.49	3.43	13.90	13.75
6	10.69	11.38	3.58	3.87	14.17	15.25
7	11.01	10.50	3.81	3.70	14.82	14.20
8	10.14	11.40	3.46	3.60	13.60	15.00
9	10.48	10.10	3.53	3.40	14.00	13.50
10	8.70	9.36	3.65	3.64	12.35	13.00
11	10.29	11.17	3.66	3.93	13.95	15.10
12	10.23	9.68	3.51	3.32	13.74	13.00
13	10.52	11.17	3.54	3.73	14.06	14.90
14	9.03	9.55	3.22	3.35	12.25	12.90
15	10.76	11.55	3.59	3.65	14.34	15.20
16	10.38	9.90	3.42	3.30	13.80	13.20
17	8.88	8.38	2.98	2.75	11.85	11.00
18	6.30	8.25	1.90	2.12	8.20	10.50
19	9.90	10.27	3.41	3.43	13.30	13.70
20	8.27	8.51	2.69	2.69	10.95	11.20
21	9.45	10.09	2.05	2.21	11.50	12.30
L.S.D 0.05	1.01	0.49	0.39	0.25	1.24	0.54
L.S.D 0.01	1.34	0.65	0.52	0.33	1.65	0.71

4) Average root length (cm.) :

Data for this character are presented in Table (3). The results revealed that cultivars varied significantly with regard to their root length Purple selection was intermediate (12.75 and 14.00 cm.). Nandrin F1, Nantuchet F1 Mokum F1 and Laranda F1 gave the longest root length; (15.25, 13.85),(15.25,17.20),(15.00 15.20) and (15.00,14.80 cm) in the first and second seasons, respectively. While Chantenay red cored gave the shortest roots (9.75,11 00 cm).

5 Average Leaf length (cm.) :

The average leaf length (cm.) of the 21 cvs are shown in Table (3). Purple selection gave the longest of leaves (40.0 and 42.00 cm.). While cv.

Flakkeer regol (18.75,20.00 cm), and Chantenay extra long (19.00 21.50 cm.) gave the lowest average leaf length.

6) Average number of leaves per plant :-

Data for this character are presented in Table (3). Significant differences were found regarding number of leaves per plant for the different cvs. Purple selection produced greater number of leaves / plant(8 and 9) was ranked number five among the 21 cvs, following Kohli 200 Kikuys, Balady Local and Nantuchet F1. However, Danvers 126, and Chantenay red cored gave the lowest value (4.75,5.38 and 5.00,6.00) respectively.

7) Average top, middle and tip root diameter (cm.) :-

Data for these three measured characters are presented in Table (4). Root diameter at the three points were significantly affected cultivar. Purple selection gave an intermediate value for the root diameter at the three measured points (2.6 , 2.2 and 1.7 cm.), and (3.15,2.35 and 1.80 cm.) in the first and second seasons respectively Nantuchet F1 (3.25, 2.83, and 1.98) and (3.85,2.94 and 2.00 cm.) Kohli 200 (3.20, 2.70 and 2.08 cm) and (3.72,2.80, and 2.10 cm) respectively, and Nandrin F1 (3.15, 2.48 and 1.45) and (3.60,2.50 and 1.55 cm). gave the highest root diameter at the top, Medium and tip of the root. However Flakkeer regol (1.15, 1.08 and 1.00) and (1.65,1.30 and 1.15) and Laranda F1 (1.92, 1.70 and 1.45) and (2.48, 1.80 and 1.55) gave the lowest value for the three values of the root in the first and second seasons respectively

8) Thickness Cortex and core diameter :

Data for these two character are given in Table (5) Cortex diameter showed significant difference between Purple selection and the other 20 genotypes used in this study. The cortex size of Purple selection was intermediate (1.38 and 1.69 cm) in the first and second seasons respectively. The core diameter was significantly affected by cultivar. BCT 3802 Kohli 200 and Nandrin F1 gave the highest value for core diameter in this study (1.64, 1.91),(1.68 ,1.93) and (1.60 ,1.90 cm). On the other hand, Flakkeer regol gave the lowest value (0.55 ,0.88 cm.). Purple selection produce an intermediate core size (1.22 and 1.44 cm.) in the first and second seasons respectively

9) Root Total Soluble Solids percentage (T.S.S.) :-

Purple selection produced an intermediate T.S.S percentage (8.75 and 9.50) (Table 5) Berlanda F1, and Chantenay extra long gave the highest total soluble solids in root (11.50, 11.00 , 10.50 and 10.80 %). While Kazan F1 and Kamaran F1 gave the lowest records (6.50, 6.80,7.00 and 7.38 %) in the first and second seasons respectively Taha (1994) indicated that Chantenay cultivar gave a higher T.S.S. values than cv. Balady.

Table 3: Root length (cm) length of leaves and number of leaves per plant of purple selection as compared to 20 carrot genotypes grown under Middle Egypt conditions in 1999/2000 and 2000/2001 seasons.

Cultivar No	Root Length (cm)		Length of Leaves		No. of leaves / plant	
	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001
1	12.75	14.00	40.00	42.00	8.00	9.00
2	9.75	11.00	26.25	28.50	5.00	6.00
3	14.00	15.00	28.75	30.00	4.75	5.38
4	10.75	10.50	24.35	26.50	5.75	6.50
5	15.25	13.85	27.25	28.50	5.75	7.00
6	9.75	10.50	31.00	33.25	6.50	7.50
7	10.50	12.00	31.75	32.75	6.75	7.50
8	11.75	12.50	28.00	29.00	5.00	5.88
9	10.00	11.00	32.00	34.00	6.25	7.50
10	11.80	13.20	35.00	36.50	8.25	9.00
11	11.00	12.50	34.75	35.50	6.25	7.50
12	11.25	11.00	38.75	40.00	8.50	8.75
13	12.50	12.20	38.50	39.50	9.00	9.00
14	10.00	11.10	31.50	33.25	6.50	7.69
15	15.25	17.20	30.25	32.50	8.00	9.10
16	14.50	15.00	26.35	28.50	6.75	8.00
17	13.75	14.50	24.75	26.00	6.00	7.00
18	12.25	13.69	19.00	21.50	6.00	7.00
19	15.00	15.20	27.00	29.00	6.25	7.00
20	15.00	14.80	15.75	22.50	7.50	8.50
21	12.25	12.70	18.75	20.00	6.00	7.00
L.S.D 0.05	1.52	0.94	4.69	0.90	1.16	0.50
L.S.D 0.01	2.02	1.24	6.24	1.20	1.54	0.66

Table (4): Average top, middle and tip (cm) root diameter, of Purple selection as compared to 20 genotypes of carrot grown under Middle Egypt conditions in 1999/2000 and 2000/2001 seasons.

Cultivar genotypes No	Root total yield ton/fed		Leaves weight ton/fed.		Biological ton / fed.	
	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001
1	2.63	3.15	2.22	2.35	1.67	1.80
2	2.50	3.02	2.35	2.40	1.42	1.60
3	2.40	2.90	2.02	2.15	1.42	1.63
4	3.00	3.47	2.53	2.65	1.65	1.75
5	3.15	3.60	2.38	2.50	1.45	1.55
6	2.75	3.25	2.40	2.52	1.72	1.85
7	3.00	3.50	2.25	2.35	1.77	1.90
8	2.25	2.76	1.95	2.05	1.65	1.75
9	2.70	3.25	2.28	2.40	1.65	1.77
10	2.05	2.53	1.85	1.95	1.58	1.77
11	3.08	3.60	2.47	2.55	1.63	1.80
12	3.05	3.57	2.55	2.65	1.38	1.95
13	3.20	3.72	2.70	2.80	2.08	2.10
14	2.80	3.30	2.40	2.90	1.47	1.55
15	3.25	3.85	2.83	2.94	1.98	2.00
16	2.13	2.65	2.00	2.05	1.50	1.60
17	1.77	2.25	1.67	1.80	1.25	1.35
18	1.60	2.11	2.50	1.75	1.45	1.60
19	2.15	2.65	1.92	2.20	1.17	1.25
20	1.92	2.48	1.70	1.80	1.45	1.55
21	1.15	1.65	1.08	1.30	1.00	1.15
L.S.D 0.05	0.30	0.12	0.29	0.12	0.32	0.13
L.S.D 0.01	0.40	0.16	0.38	0.16	0.42	0.17

10) Correlation study:

The Correlation study showed the three was a higher positive significant relation between weight leaves / length leaves (0.65 and 0.69), root weight / leaves weight (0.43 and 0.50) and top root diameter / tip root diameter (0.65 and 0.74). However the relation between root weight / root length was negatively significant (0.04 and 0.025) in the first and second seasons respectively.

11) Taper coefficient percentage :

As shown in Table 6 chentenay exte long and Flakkeer regol gave the best percentage (111.03 , 132.24), and (121.67 , 143.83 %) respectively. While Nandrin F1 gave the highest percentage (220.31 and 232.27 %) in the first and second seasons respectively.

Table (5): Cortex thicken, core diameter T.S.S. and taper coefficient of Purple selection as compared to 20 genotypes of carrot grown under Middle Egypt conditions in 1999/2000 and 2000/2001 seasons.

Cultivar No	Cortex thicken (cm)		Core diameter (cm)		T.S.S %	
	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001
1	1.38	1.69	1.22	1.44	8.75	9.50
2	1.43	1.72	1.07	1.30	9.25	8.50
3	1.20	1.45	1.20	1.45	8.25	7.80
4	1.58	1.84	1.42	1.64	7.75	8.20
5	1.60	1.70	1.60	1.90	8.50	8.00
6	1.40	1.62	1.40	1.63	7.00	7.38
7	1.50	1.75	1.50	1.75	7.50	7.80
8	1.24	1.46	1.66	1.30	7.75	7.50
9	1.35	1.62	1.35	1.63	6.50	6.80
10	1.05	1.26	1.05	1.27	8.50	9.40
11	1.46	1.69	1.64	1.91	9.25	10.00
12	1.55	1.78	1.55	1.79	9.75	9.50
13	1.52	1.79	1.68	1.93	8.75	9.20
14	1.40	1.65	1.40	1.65	10.00	10.50
15	1.65	1.96	1.65	1.89	8.50	9.20
16	1.13	1.40	0.97	1.22	9.50	10.38
17	0.95	1.12	0.90	1.13	11.50	11.00
18	0.96	1.22	0.91	0.89	10.50	10.80
19	0.88	1.06	1.32	0.59	9.00	9.40
20	0.76	1.02	1.14	1.46	9.50	9.60
21	0.55	0.82	0.55	0.88	10.00	10.50
L.S.D 0.05	0.01	0.08	0.01	0.06	1.22	0.17
L.S.D 0.01	0.02	0.10	0.02	0.08	1.63	0.24

12) Calcium, Potassium and dry matter percentage :

Data for these character are given in Table (6). Regarding calcium level, Purple selection and Kamaran F1 gave the highest value for both elements (38.90, 40.50) and (39.08 , 40.70) in the first and second seasons respectively. Farther, with regard to potassium level in the roots Purple selection and Skinkuro T.A. produced (1.24, 1.27 and 1.25, 1.27) in the first and second seasons respectively.

Concerning the dry matter of the roots there was significant difference between the 20 cvs. and Purple selection Table (7). Mokum F1 gave the highest value 88.95, 91.70 while Purple selection was intermediate (88.33 , 90.90) in the first and second seasons respectively.

Taha (1994) indicated that Chantenay c.v. gave higher percentage dry matter than Balady

Nilson (1987) showed in a reduction in the growth of both roots and foliage and with roots having lower dry matter content

Table (6): Taper coefficient percentage ,Calcium and Potassium levels of Purple selection as compared to 20 carrot genotypes grown under Middle Egypt conditions in 1999/2000 and 2000/2001 seasons.

Cultivar No	Taper coefficient		Calcium value		Potassium levels	
	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001
1	160.05	174.99	38.90	40.50	1.24	1.27
2	175.09	189.07	37.00	38.50	1.21	1.24
3	172.09	177.94	39.00	40.60	1.18	1.20
4	183.24	198.71	38.78	40.30	1.25	1.27
5	220.31	232.27	37.48	39.00	1.19	1.21
6	160.28	176.59	39.08	40.70	1.22	1.24
7	168.77	184.33	37.43	38.90	1.18	1.20
8	136.63	158.17	39.00	40.60	1.15	1.17
9	163.61	183.60	38.38	39.90	1.21	1.23
10	129.75	148.99	38.28	39.80	1.17	1.19
11	198.16	200.66	38.23	39.70	1.20	1.22
12	168.00	183.11	38.13	39.70	1.13	1.15
13	157.68	177.38	38.48	40.00	1.19	1.21
14	192.71	213.46	38.33	39.80	1.19	1.21
15	167.69	192.62	38.88	40.50	1.21	1.23
16	142.09	165.70	39.13	40.70	1.17	1.19
17	142.86	166.85	38.25	39.80	1.21	1.23
18	111.03	132.24	38.70	40.30	1.16	1.18
19	184.85	215.36	37.85	39.30	1.20	1.22
20	133.21	160.02	38.38	39.90	1.15	1.17
21	121.67	143.83	37.90	39.40	1.21	1.23
L.S.D 0.05	28.96	16.10	1.06	1.11	0.05	0.06
L.S.D 0.01	38.52	21.42	1.40	1.47	0.06	0.08

Table (7): Dry matter percentage of Purple selection as compared to 20 carrot genotypes grown under Middle Egypt conditions in 1999/2000 and 2000/2001 seasons.

Cultivar No	Dry matter percentage	
	99/2000	2000/2001
1	88.33	90.90
2	87.63	90.30
3	88.68	91.40
4	86.43	89.00
5	88.33	91.00
6	88.03	90.70
7	88.45	91.10
8	88.20	90.80
9	88.45	91.10
10	88.65	91.30
11	87.58	90.20
12	88.30	90.90
13	87.33	89.90
14	87.00	89.60
15	88.08	90.70
16	86.88	89.50
17	88.00	90.60
18	87.45	90.10
19	88.95	91.70
20	88.13	90.70
21	89.08	91.80
L.S.D 0.05	0.93	0.57
L.S.D 0.01	1.24	0.75

REFERENCES

- Bajaj, K.L. ; K. Gurdeep ; B.S. Sukhija ; G. Kaur (1980). Chemical composition and some plant characteristics in relation to quality of some promising cultivars of carrot (*Daucs carota L.*) Qualities Planetarium, 30 (2): 97 – 107.
- Brune – S.; VQ. Ribeiro and H. M. Batista (1988). Performance of carrot cultivars. Horticulture – Brasileira 1988, 6 : 1, 13 – 14 (C.F. CAB Abstracts 1987 – 1989).
- Bujdoso – G. and I. Hrakso (1988). Evaluation of carrot cultivars suitable for storage. Zoldseg – Termesztesei – Kutato – Intezet – Bulletinje. 1988, 21 : 101 – 109 (C.F. CAB Abstracts 1987 – 1989).
- Gomez, K. A. and A.A. Gomez (1984). Statistical procedure for Agricultural Research 2nd (Ed) John Wily & Sons New York
- Hussein , H.A ; M.A. Ferghali ; K.A. Okasha and E.M. Makar (2000). Improving quality in inbreeds of slow – bolting anthocyanin carrot . 1- Effect of sowing date on root growth and quality. The 2nd Scientific Conference of Agric. Sci., Assiut, Oct. 2000, Egypt.
- Hussein, H. A. (1985). Inheritance of some economic character in crosses between Balaçy and foreign cultivars of carrot ph. D. thesis. Dept. of Hort. Univ. of Assiut, Egypt.
- Hussein, H. A. (1993). The use of the inbred backcross method in breeding for show – bolting anthocyanin carrot. Minia J. Agric. Res. and Dev., 15. 23 – 36.

- Jin Weiliang ; Lu XinDe and Zhang Run. (1999). (The selection of carrot variety xin Huluobu No. 1 for both fresh edible and processing) China Vegetables (1999) No. 1. 31 – 32. (C. F. Hort. Abstr. 70, 2172).
- Netra Pal; D.C. Pachauri ; P.M. Bhagchandani and R.K. Sharma (1993). Carrot " Pusa Meghali " for the tropics. Indian Horticulture. 38 (3) 35.
- Nilsson, T.(1987). Growth and chemical composition of carrots as influenced by the time of sowing and harvest.)Journal of agricultural Science, 108 (2):459-468.
- Riad – WY.; A.A. Atwa and S.M. Dessouky (1981). Evaluation of some carrot varieties for quality and marketing character Agricultural Research – Review, 59(3): 255 – 263.
- Rofael Salwa D. and H. A. Hussein (1998). New products of slow – bolting anthocyanin carrot lines. Bulletin of high Institute of public Health, 28 (3) : 94 – 98.
- Sazonova – L (1986). Yield and its components in carrot varieties. (C.F. CAB Abstracts 1987 – 1989).
- Schulz, F ; N. Stafflage – Nuphaus and W. Karalus (2000). Yield and quality of carrot varieties in organic cultivation) Gemuse (Munche) (2000) 36 (1) 26 – 28 (C. f. Hort. Abst. 70, 4916).
- Taha, R. M. (1994). Effect of some weed control treatments and seed rate on yield and quality of carrot (*Daucus carota* L.) M. Sc. Thesis, Fac. Agric., Assiut Univ.
- Zufanek – J. and B.Groda. (1988) . Root vegetables : improving the effectiveness of harvesting on the basis of knowledge of root morphology. Zemedelska – Technika. 1988, 34 : 11, 683 – 698 ; 4 Ref. (C.f. CAB Abstracts 1987 – 1989).

قيّم إنتاجية وجودة طراز وراثي جديد من الجزر تحت ظروف مصر الوسطى كمال عبد الإمام عبد العزيز

معهد بحوث البساتين – مركز البحوث الزراعية – الجيزة – مصر

- أجرى هذا البحث في مزرعة محطة البحوث الزراعية بملوي محافظة المنيا في موسمي ١٩٩٩/٢٠٠٠ و ٢٠٠٠/٢٠٠١ لدراسة جودة وكمية المحصول في السلالة المنتخبة البنفسجية (بلدي) ومقارنتها بالأصناف الأجنبية في الأرض السلتية الطينية تحت ظروف مصر الوسطى وأمكن الحصول على النتائج التالية:
- ١) أعطت السلالة المنتخبة البنفسجية (البلدي) أعلى التقييم في وزن الأوراق بالمطن للنتان ووزن المحصول الكلي طن / فدان ومتوسط طول الورقة وعدد الأوراق بالنبات
 - ٢) أعطت السلالة المنتخبة البنفسجية (البلدي) قيم متوسطة بين الأصناف في صفات وزن الجذور ومتوسط طول الجذر ومتوسط قمة ومخروط طرف الجذر واللحاء والقلب والمادة الصلبة الذائبة الكلية.
 - ٣) أعطى الصنف سلكيوت ت أ أعلى قيمة في وزن الجذور ووزن المحصول الكلي ، بينما الصنف شنتاي رديكور أعطى أقل قيمة في وزن الجذور ومتوسط طول الجذور وكذلك الصنف شنتاي اكسترا لونج أعطى أقل محصول كلي
 - ٤) أعطى الصنفان ناندرن ونايتوش في الجيل الأول أقل قيمة في متوسط طول الجذر ومتوسط قطر الأتمة والمتوسط والطرف بالنسبة للجذر بينما أعطى الصنف فلاكلير ريجول أقل قيمة.
 - ٥) الجيل الأول من الأصناف دسي تي ٣٨٠٢ وكولي ٦٠٠ وناندرين أعطى أعلى قيمة في سمك اللحم وانقلب ينم الصنف فلاكلير ريجول أعطى أقل قيمة
 - ٦) أعطى هجين الجيل الأول من بير لاندأ وكذلك الصنف شنتاي اكسترا لونج أعلى نسبة مئوية في المادة الصلبة الكلية بينما أعطى الجيل الأول من كل من الصنفين كيزان وكبيران أقل قيمة.
 - ٧) وجد ارتباط موجب بين كل من وزن الأوراق (العرش) وطول الأوراق والعلاقة بين وزن الجذر ووزن الأوراق والعلاقة بين قمة الجذور وقاع الجذور ، بينما كانت العلاقة سالبة بين وزن الجذور وطول الجذور في كلا الموسمين