

evaluation of yield, quality and quantity characteristics of Strawberry Cultivar under greenhouse conditions in jiroft and kahnoj rejoin.

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ABSTRACT : Jiroft with unique climate is one of the important and suitable regions for production of greenhouse crops in Iran. strawberries are a viable crop in most greenhouse of the jiroft. Selection of appropriate varieties is important besides determining yields and quality. In order to In this study, cultivars including paros, kamarosa, quineliza, pajaro, silva, diamond, gaveota. Merk, meseonarry and kordestan were grown to evaluate their yield and quality under greenhouse in 2007-2008 years. the experiment was in a randomized complete block design with three replication. During the production in the greenhouse, the parameters such as total yield, titratable acidity quantity, soluble solid content, vitamine of C and diameter and weight average of fruit were measured. According to total yield of two years, there were significant differences between cultivars. There were also significant differences in average fruit weight among cultivars, the highest average fruit weight under conventional and greenhouse followed by quineliza and paros cultivars.. Titratable acidity of fruit was not strongly affected by cultivars management and it was lower under growing conditions. pajaro cultivar were produced highest growing runners during tow years. Generally resultes showed that paros, kamarosa, quineliza, pajaro and silva cultivars are recommended for greenhouse of the jiroft and similar regions.

Key words: cultivar, Selection, Strawberr, greenhouse, Jiroft

INTRODUCTION AND LITERATURE REVIEW

Strawberry with scientific name FRAGARIA VESCA from red flower family rosaceae that is eatable part in fact is flower receptacle which grows gradually and use as strawberry fruit. the flowers are white. It can grow under -5°C in cold climate without cover, also it can grow under -18°C with special cover. It is regarded as a plant that not need to grow in the cold condition, so that in 200-400 hours of lower temperature than 7°C , does not need to grow in cold condition, because their shallow root grow the is 15-20 cm the plant is sensitive to water shortage. In 1000 m^2 under culture surface greenhouse use honey bee hive for pollination and better inoculation of strawberry flowers. the under culture area of strawberry in Iran is about 8800 hectare that in comparison with universal 2/600/000 include 0.14% of to had world strawberry cultivation. It has 14 place among all the countries in the world the that has 18 place among the world countries which produced 4/000/000 ton. the main regions for strawberry production in the Iran include: Kordestan, Mazandaran, Golestan, Tehran, Jiroft and Kahnoj respectively. strawberry is a good source of fiber, Vitamin C, Folate, potassium and antioxidant. these nutrient is good for heart healthy and decrease cancer diseases. The local cultivars of strawberry in Iran included: Kordestan, Gilasi, Atabaki and Delandi. The commercial cultivars of strawberry in Iran include: Silva, Kamarosa, quineliza, paros, Gavioota, and Pajaro.

85% of this open space crop supply in to markets from early may to late june. the remaind 15% supply from middle September to late ocober. 95% strawberry crop in Iran produced in open space. Jiroft with unique climate, suitable soil, sun shin and sufficient water is one of the most susceptible parts of Iran for green house strawberry cultivation, so that this crop produce in Autumn season with the low cost and supply it into the market during januray, February, march, and April, and because this region is near Golf persion there is a hopeful overactive for exporting this product (statistical and information of agriculture ministry). The under culture space of greenhouse strawberry in jiroft and Kahnoj is more than 50 hectore with the yield of 35-40

ton per hectares . the other plant varieties of the green house in jiroft and Kahnooj are such as : cucumber , papper , eggplant and lettuce with 1750 ton per year. the strawberry consumption per capita in Iran is about half Kg for each person and the strawberry wastes is about 25% the cost for each strawberry kg in green house is about 40 rials since . strawberry cultivars have different reaction in different climate , so the selection of one or some cultivars for planting is very difficult and need local special test . to perform Agronomical tests such as cultivar introduction , shrub density , culture method and etc... on strawberry is necessary to increase the production efficiency . this kind of production from the point of agriculture experts views very important , because the green house products are multiple per surface unit and their quality is better than open space crops and it 's products are more economical than open space crops . In selection of strawberry cultivars some parameters and conditions involved , so a common recommendation needs for cultivars selection and introduction for planting in open and closed spaces . may be some fruits of one cultivar in an area to be produced big , hard , pretty color , and delicious in the other areas to the produced small , soft , bad color and bad favor .

There fore , the yield and quality of strawberry affected on environment and genotype complex process . so the selection of cultivars should be per farmed by exact recognition and present condition .

Durent the recent 30 years , different cultivars study by private and public sectors via their compatibility to different climate , pests and disease . the results of this consideration lead to select suitable and productive cultivars beside the traditional cultivars . the research by Mr . Biat in Karaj shows that highest capacity and weight of fruit related to Alizo and Blakomor cultivars and the highest stolon products belongs to sookia and misionery cultivars . the best growth belongs to katchil and kordestan cultivars . the best favor and odor belong to katstil , s.p.1 and kordestan cultivars . the highest percent of solution solid materials from misionery , yalva and ferzno cultivars selected . In the other studies , in order to show the compatibility and yield of 15 strawberry cultivars in open space in kordestan , Ferzno , kordestan and misionery cultivary with 13.811.9, 11.6 devoted them selves first to third places receptively . (2) the results of studies in kanada , Vester , Redcat , sparkle , with kent , Honeoye , Glooscal cultivars(11), in U. S. A , tungi , sanrice , Euribelle with chandler , Eurliglow, Apollo cultivars in Europe , tuffs , Heidi tioga with chandler , silva , pajaro replaced (7) . Arakti and etal 1994, studied teodora, clea, Eglia cultivars in south of Italy (6).

The research by Hony in Germany 1996 shows that the highest product belong to Elsanta cultivars whti 780 g per shrub , marmolada with 760 g per shrub and malling Pandora with 705 g per shrub . Greek chandler Dovera , Douglas with production rate 802 , 17.34 , 17.4 ton per hectare selected as the best cultivars respectively .

MATERIALS AND METHODS

In this research , 10 preferred cultivars from the same research results include: kamorosa , pajaro , parose , Quineliza , Diamont , merk , Gavioota , Kordestan , misionery and silva studied in the from of random complete blocks plan in 3 reception in 2008 -2009 at shahid moghbeli , Agriculture greenhouse research center in jiroft and kahnooj for implementation used row culture system with 80 cm wide . before the culture , the roots pruning and dried with air flow and kept separately , the shrub planted in two rows with 25 cm space, 20 shrubs plants in each row . After planting used some blank polyethylene malch on the rows and also used trickle irrigation . using black polyethylene (malch) can cause to reduce water consumption , control pests, diseases and increasing the yields the evalated . attributes include : yield per surface unti , total yield , fruit mean weight , soluble solid content, vitamin C and acidity .

The measurement method for measuring parameters

Fruit mean weight

In order to obtain mean weight per fruit from each row, 10 fruits selected and weighted randomly and then divided into weighted fruits , so mean weight for each fruit obtained by digital scale.

Crete yield : is the total mean of each harvest

Acidity : 10cc of fruit juice extract prepared from each plot and estimated beside normal $\frac{1}{10}$ soda with phenol phetaline titer and obtainaed acid citric .

Vitamin C content : obtainaed by using of fruit juice extract and iodine potassium .

TSS : After obtainaed 10 mm extract from fruit juice randomly per plot , estimated by reflectometer.

this test performed in two years in jiroft shahid moghbeli agriculture greenhouse research center and the data analyzed by SAS software and their average compared with Donkan method . finally ,the best cultivars for planting in green house in traduced .

Table1. The analysis of greenhouse soil

EC ds/m	PH	o.C(%)	P (ppm)	K(ppm)	CU (ppm)	ZN (ppm)	MN (ppm)	FE (ppm)
2/55	7/6	0/1	4/2	205	1/52	1/08	11/14	2/3

Table2. The analysis of water.

EC ds/m	SAR	Cl ⁻ (meg/lit)	(meg/lit) ^{Na}	Ca&mg (meg/lit)	Hco ³⁻ (meg/lit)	Co ^{3²⁻} (meg/lit)	PH
760	0/76	1/4	2/05	14/4	2/14	0/48	7/1

RESULTS AND DISCUSSION

Table 3. Analysis of variance qualities.

Treatment	Cultivar	Yield mean(g/shrub)
3	Quineliza	58/580A
1	Paros	53/121AB
2	Kamarosa	48/780ABC
4	Pajaro	42/133BCD
5	Silva	39/043CD
6	Diamond	38/615CD
7	Merk	38/570CD
8	Gaveota	38/087CD
9	meseonarry	36/090D
10	Kordestan	22/187E

Table 4. the comparison of qualities average.

treatment	Yield	Tss	Vitamin C	Acidita	WeightFruit(g)	Yield(ton)
Paros	79/39a	7a	112.3 abcd	0.57 de	19.8 b	71.45a
Kamarosa	53/60b	6.6a	117.8 a	0.654 ab	22 a	48.24b
Pajaro	52/84b	7a	103.7 bcd	0.658 a	21.7 a	47.55b
Quineliza	50/32b	7a	115.3 a	0.654 ab	17.8 bc	45.28b
Silva	38/57cd	7a	123.7 abc	0.620bcd	18.5 bc	34.71cd
Diamond	38/24cd	6.8a	101bcd	0.587de	16.3bcd	34.41cd
Merk	33/77e	6.4b	105.9 bcd	0.618 cd	16.2 cd	30.39e
Gaveota	33/63e	6.6b	101.7cd	0.556 ef	17.2 bcd	30.26e
meseonarry	9/81f	7a	113.4bd	0.614 bc	10/8 f	8.82f
Kordestan	F5/87	A7/0	116.5 abc	0.588 ab	8/7 f	5.22f

Means with similar letters (small letters for whole means and capital letters for means of rows and columns) are not significantly different at 5% level of probability using Duncan's multiple range test.

Based on the above results, the implementation of treatment were different and had meaning ful difference , but there was different content of acidity and TSS between different treat mens that show different quality and quantity in different greenhouse condition .According to the obtained results effects on different harvest and treatments are different . there was a meaning ful different between yield average shrub that the highest with 71.45 belongs to parose, and 48.24, 47.55 and 45.28 ton belong to kamarosa , pajaro and Quineliza respectively , and silva and diamond cultivars with 34.71 , 34.41 planced in the next row . the TSS content except in merk and Gaviota hadn't a meaningful difference . the highest acidity belong to kamarosa , pajaro, Quineliza and kordestan . the highest fruit mean weight with 22 and 21.7 g belongs to kamorosa and pajaro and the least with 8.7 , 10.8 belongs to kordestan and missionary cultivars. According to compound analysis in two years ; parose , kamorosa , pajaro , Quineliza and silva remmended for planting in giroft , kahnooj and the same regions, missionary and kordestan cultivars because of low yield, not recommended to plant in jiroft and kahnooj green house. TSS content is a genetic quality that some cultivars have the highest and some have the least . the preference of pajaro and silva cultivars in this research is responded with preference Burning cultivars in Europe . parose , kamorosa , Quineliza cultivars reported as the best cultivars in Iran by Mr . Biat . At the present , the yield of green house with 35 ton per hectare and the price of each kg 25000- 30000 rials have about 700/0000/000 to 800/000/000 rials total sale with correct management condition with reduction of 300/000/000 Rials current cost , the producer has about 400/000/000 – 500/000/000 be modernized and needed good markets and government support.

Kamorosa had a wide plant rate in the region which is the results of treatment program from California universities this cultivars has a good adaptation to the regional climate with mild winters the fruit of silva cultivar is big , hard , and has the highest yield and it has adaptation to the regional environment and continent with high efficien. the fruit of missionary and kordestan cultivars in giroft and kahnooj greenhouse are small and wilting they are not recommedede in this region , they are suitable in kordestan. TSS is a genetic quality that some cultivars and some of them have the least . the preference of silva and pajaro cultivars. based on the results of this research is cor responded with Burninig preference cultivar in Europe . parose , kamororsa , and quineliza cultivars introduced as the best cultivars in Iran by Mr . Biat and etal . parose, Kamorosa , pajaro and quineliza have the highest yield in comparison with silva cultivar. the diamond, merk, Gaviota, missionary and kordestan in comparison with silva cultivars . According to the obtained results of compound analysis in two years , parose , kamorosa, pajaro and quineliza beside silva cultivars recommended to be planted in jiroft kahnooj and the same regions .

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