

THE PECULIARITIES OF EARLY SPECIES OF TANGERINE IN ADJARA

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Phenological observations have been provided over 11 species of tangerines (Nichinani, Iura-Vase, Taguchi Vase, Miagava Vase, Kavada, Nankani-20, Ohotsu Vase, Ueno Vase, Aoshima, Okitsu Vase, Mukaiama) introduced from Japan in 2010 on the experimental plot of Daba Chakvi in Kobuleti Municipality. The studies showed that only three species of the abovementioned species of tangerines (Nichinani, Iura-Vase, Taguchi Vase) belong to the super early species of tangerine according to their biological peculiarities and massive ripening period of fruits. They ripen 35-40 days earlier than any other basic industrial species (broad-leaved Unshiu), their fructification period is long and they are characterized with high productivity and better quality of fruit.

INTRODUCTION

Citrus in Georgia was imported from China and Japan in 1880s. The first plantations were cultivated in Daba Chakvi. Only some of the species of tangerine adapted to the local soil and climatic conditions, and especially the tangerine Unshiu (imported in 1886 by the expedition of the professor Krasnov and an agronomist Klingen), one of the flaws of which is considered to be the ripening of fruits from the mid-November, which has negative influence on the durability of the plant and on the accumulation of protecting organic substances [1-5].

Besides, the frequent rains, hail and sometimes snow during the fruit-picking period make it difficult to reap the harvest; the marketable image of the fruit is lost; the quality and the storage capacity of fruit are reduced and all these cause significant damage to the farmers working in the field of citrus and the economy of the country, in general [5].

According to the abovementioned, in order to prolong the period of fruit consumption or make it frost-resistant, breeding the early species of tangerine at place or importing them from different countries is of a great public and agricultural importance for the population [6].

Therefore, the purpose of our study was to reveal the positive agricultural peculiarities characterized to the species, as a result of which we would be able to give recommendations to the farming areas and experimental-demonstrative plots.

OBJECTIVES AND METHODS

The experiment was conducted on south-eastern slopes with 15-20 degree, where the plants are planted with 4X2,5 m feeding area, on the height of 20-25 m above the sea

level. The soil under the experimental plants is red. We took 10 plants from each species and conducted experiments of 110 plants. All the experimental plants were numbered, labeled, and the data obtained as a result of observation were brought into a special register where all the data were recorded for each plant provided for phenological observations [7, 8].

We took photographs of both - fruit-bearing plants and the process of picking fruit. We took fruit from different expositions of the plant for studying its biochemical indicators [9].

We determined the end of vegetation of the first and second growth on each species, the start of ripening fruit of the plant (height, stem, rootstock and scion diameters in cm.) and massive ripening of fruit, productivity (pieces, kg.), the average weight of one fruit (gr.), fruit coloring, the quality of skin removal off the pulp, the number of particles in the pulp, foliation, etc. (Table 1).

RESULTS AND ANALYSIS

The species of tangerine introduced from Japan revealed almost the same peculiarities in our conditions as in their homeland. The following three species are to be particularly distinguished: Nichinani, Iura Vase and Taguchi Vase. Their fruit started to ripen in the 1 decade of September and massive ripening of fruit – in the end of September and in the beginning of October. Harvest is satisfactory. The average weight of one fruit ranges from 50 to 80 gram. The number of particles in pulps is 10-11. The species Iura Vase is distinguished with higher sugar content. Ascorbic acid is normal in the fruit but its negative feature is thin

skin which is very difficult to remove from the pulp [10]. As for the fruits of Miagama Vase, Kavada, Nankani 20, Ueno Vase and Okitsu Vase, they are ripe in the third decade of October and are distinguished with their high quality marketability (Table 1).

Since the new species have been cultivated on the areas where the tea plantations were grown, we studied its agrochemical indicators according to the variants. We took the samples of soils out of 0-40 cm depth where the common humus and NPK were studied. As the tea plantation areas were not whitewashed for 80 years, the soil contained high acidity; the common humus and NPK data were little and very poor. We obtained very interesting outcomes as a result of technical and biochemical researches of fruit. We determined the dry substance, C vitamin and sugar consistency, titratable acidity, pH indicator in the fruit juice etc. (Table 2).

As for Ohotsu Vase, Aoshima and Mukaiama, they start ripening up their fruits in the beginning of November which makes it no difference from the tangerine Unshiu which is so wide-spread in Georgia.

CONCLUSION

According to the four-year-long experiments and scientific research data, we can make following results:

-according to the fruit ripening period, 3 species (Nichinani, Iura Vase, Taguchi Vase) of the 11 tangerine species introduced from Japan, belong to the super early tangerine species and they are distinguished from the regional species with their high productivity and better quality of fruits.

-the abovementioned tangerine species relatively better adapt with the soil - climatic conditions of the humid subtropical zone and as a result of the further observations

they will be given recommendations for implementing in farms.

-the results obtained from our research can be generalized for the countries of subtropical zone in the Black Sea basin where tangerine cultivation technologies are intensively introduced.

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ОСОБЕННОСТИ РАННИХ ВИДОВ МАНДАРИН В АДЖАРИИ

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Фенологические наблюдения были выполнены на более чем 11 видах мандарин (Ничинани, Юра vase, Тагучи vase, Миагава vase, Кавада, Нанкани-20, Окоцу vase, Уэно vase, Аошима, Окицу Vase, Мукаиама), которые были завезены из Японии в 2010 году и разведены на экспериментальной базе поселка Чакви Кобулетского муниципалитета. Исследования показали, что только три вида вышеназванных сортов мандарин (Ничинани, Юра-vase, Тагучи) принадлежат к супер ранним видам мандарин в соответствии с их биологическими особенностями и сроков созревания плодов. Эти виды созревают на 35-40 дней раньше, чем любые другие промышленные виды. Продолжительность их созревания достаточно большая и они характеризуются высокой производительностью и лучшим качеством плодов.

Table 1. Basic Phenological Observation Data on Different Species of Tangerine (2001-2014 average)

N	Species	End of 2 nd growth	Beginning of ripening fruit	Massive ripening of fruit	Productivity		Average weight of one fruit (gr)	Number of particles in the pulp (units)
					Pieces	In Kg		
1	Nichinani	II decade of August	I decade of September	III decade of September	329	19,6	57,7	11
2	Iura-Vase	I decade of August	I decade of September	III decade of September	452	19,9	44,3	11
3	Taguchi-Vase	I decade of August	II decade of September	I decade of October	320	26,7	82,5	10
4	Miagave-Vase	II decade of August	I decade of October	III decade of October	465	26,8	55,9	12
5	Kavada	II decade of August	III decade of September	II decade of October	249	20,3	80,2	11
6	Nankani-20	I decade of August	III decade of September	II decade of October	246	18,7	73,1	10
7	Ohotsu-Vase	III decade of August	II decade of October	I decade of November	226	18,5	78,1	11
8	Ueno-Vase	II decade of August	II decade of September	I decade of October	355	21,3	59,2	10
9	Aoshima	III decade of August	I decade of October	I decade of November	56	5,4	90,1	10
10	Okitsu-Vase	I decade of August	III decade of September	I decade of October	334	21,2	62,8	12
11	Mukaiama	II decade of August	III decade of September	III decade of October	287	17,8	62,1	13

Table 2. The Agrochemical and Technical-Biochemical Research Results of Fruit on the Plot of New Species of Tangerine Imported from Japan (2011-2014. Average)

Name of sample	Skin share %	Juice yield %	Dry refr. % Brix	Titrateable acidity	Ratio sugar/acid	Vitamin C Mg/L	Indicator of ph in a fruit juice	Taste
Nichinani	20,3	54,83	10,8	0,98	11,32	547	3,32	Less sweet, specific taste
Iura Vase	20,9	66,31	14,2	1,66	8,54	455	3,23	SweetishSourish
Taguchi Vase	15,44	54,5	11,3	1,55	7,28	434	3,12	Less sour
Kavada	19,2	44,3	11,5	1,13	10,18	611	3,16	SweetishSourish
Mukaiama	21,9	29,6	12,2	1,14	10,7	614	3,25	Sourish
Nankani 20	2,3	42,2	11,6	1,58	7,34	388	3,1	Sweet
Ohotsu	23,2	40,1	12,2	1,43	8,53	595	3,06	Sourish
Ueno Vase	24,1	45,7	10,4	1,27	8,19	707	3,05	SweetishSourish
Okitsu Vase	22,5	45,8	11,5	1,29	8,91	656	3,02	SweetishSourish
Miagava Vase	22,8	40,4	12,6	1,13	11,15	653	3,09	Sour
Aoshima	18	55	7	1,3	6,2	350	3,02	Less sour