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Research Note :

REJUVENATION EFFECT ON YIELD AND FRUIT QUALITY CONTRIBUTING TRAITS OF ORANGE (*Citrus reticulata*)

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ABSTRACT : Fruits were collected from the trees indexed for healthiness and freedom from disease from the entire three former field as well as former field. The experiments were conducted during 2011-12 at Research Farm of the Krishi Vigyan Kendra, Pampoli, East Kameng, Arunachal Pradesh. Five representative orchards were selected from each formers field for collection of 1500 number of small and large fruits, respectively. Fruit were chosen from 5 randomly selected plants on the basis of fruit size. Small and large sized fruits were collected from all the four formers of East Kameng district of Arunachal Pradesh. The highest fruit weight (161.3 g/fruit), TSS acid ratio (8.0) along with lowest juice (40.9%) was observed in big size fruits. Maximum juice (53.2%), minimum waste index (0.68). Fresh fruit marketing purpose whereas small sized fruits with higher percentage of juice can be recommended for juice preparation.

Keywords: *Citrus, rejuvenation, fruit size, location, quality.*

Orange (*Citrus reticulata*) is cultivated in all the states of NE region covering 57.2 thousand ha, with production of 300.7 thousand tones. Mandarin is the most important commercial fruit crop of Arunachal Pradesh. It occupies maximum area, and grows almost in all Districts, leading cash crop of the mid hills of Arunachal Pradesh with attractive fruit colour, size and good table and processing qualities. Rejuvenation of major citrus species are possible through various aspects like production of quality planting materials, proper site selection, systematic planting, proper manuring schedule, improved orchard management practices, adaptation of suitable soil and water conservation measures, plant protection measures, dehorning and following up the round the year operation calendar. Mandarin fruit is marketed as fresh fruit from December to February while the seeds are used for raising nuclear seedling of mandarin. The world market is continually making higher demand for better quality, uniform grading, presentation, and packaging of fruits. In Florida, 95% of commercial orange production is destined for processing; mainly as orange juice while in California oranges are mainly produces for fresh consumption with only 21% for processing (Boriss, 2). The grading of fruits as per accepted quality standards help farmers, marketing functionaries, processors, traders and consumers in efficient marketing (Anon., 1).

Fruits were collected from the trees indexed for healthiness and freedom from disease from the entire three farmer fields as well as Research Farm of the Krishi Vigyan Kendra, Pampoli, East Kameng, Arunachal Pradesh during 2011-12. Five representative orchards were selected from each farmer field for collection of 1500 number of small and large fruits, respectively. Fruits were chosen from 5 randomly selected plants on the basis of fruit size. The experiment was conducted in randomized block design with three replications and 50 fruits/replication that were categorized as Jayanti village small sized fruits (T_1), Jayanti village big sized fruits (T_2), Lower pampoli village small sized fruits (T_3), Lower pampoli village big sized fruits (T_4), Pampoli village small sized fruits (T_5), Pampoli village big sized fruits (T_6), Kafla village small sized fruits (T_7), and Kafla village big sized fruits (T_8). Uniformed size small and large sized fruits were selected for the experiment. Fruits weighing 70-90 g were categorized as small sized fruits while the fruits weighing 135-165 g were categorized as large size fruits. Per cent TSS was measured by hand refractometer. Fruit shape index acidity, TSS/acid ratio and specific gravity were estimated by standard procedures. The data were analyzed statistically following the method of Panse and Sukhatme (3). The correlation between variable was calculated by partial

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correlation method and the test of significant was considered at 5% and 1% levels of probability.

Observations on various characteristics of different mandarin orchards showed significant effect of location and fruit size on morphological as well as chemical properties of fruits (Table 1). Fruit weight was significantly different for both small and large fruits at all the locations. The highest fruit weight ,recorded for big fruit collected from T_8 (161.3 g/fruit), was significant different from all other treatments.The lowest fruit weight was observed for small fruit collected from T_5 (71.3 g/fruit). Maximum specific gravity was observed in small fruits of T_5 (0.95) which at par with T_1, T_2, T_3 and T_7 but significant different from other treatments. Minimum specific gravity was found in big fruits of T_6 (0.73). Large size fruit exhibited minimum specific gravity as was also reported by Sayyad *et.al.* (4). The fruit of T_6 had the maximum fruit shape index (203.8) over the minimum in small fruits of T_2 (79.8). The heighest fruits hollowness was observed in big fruits from T_4 (1.91), however, the lowest fruit hollowness was found in small fruits of T_7 (0.88 cm).

Among all the treatment big fruits from T_6 showed the maximum peel thickness (4.6 mm) which was significantly different from all other treatments while the small fruits from T_5 and T_7 each only possessed the lowest thickness of peels (2.3 mm). Small fruits of T_7 contained the maximum juice (53.2%) that was statistically at par with big size fruit of the same location and the small fruits of T_4 and each but significantly different from all other locations. The big size fruits from Lower Pampoli village (T_4) recorded the lowest juice percentage (40.9%) and waste index (0.77) while the big size fruits from T_8 and T_2 revealed the highest waste index (1.14 each). TSS acid ratio observed in big size fruits of T_2 was the highest (8.0) as compared to all others while the lowest (3.92) was in big size fruits of T_6. The highest juice content, total soluble solid, TSS : acid ratio and palatability rating were observed for small sized fruits whereas TSS : acid ratios are not in agreement for small fruits. The small sized fruits from T_5 revealed the maximum vitamin C content (50 mg/100g) which was significantly different from other treatment with minimum in the big size fruits of T_2 (36mg/100g). The highest fruit yield/tree, recorded for big fruits collected from T_1 (330.2fruits/tree), was significant different from all other treatment and the lowest fruit yield/tree was observed for small fruits collected from T_5 (275 fruits/tree). Similar findings were also reported by Singh and Singh (5).

Table 1: Effect of fruit grade and orchard location on fruit quality parameters.

Treatment	Fruit shape index	Fruit hollowness (cm)	Specific gravity	Fruit weight (g)	Peel thickness (mm)	TSS/acid ratio	Juice (%)	Waste index	Fruit Yield /plant)	Vitamin C (mg/100g)
T_1	169.8	1.10	0.93	90.0	2.5	7.63	50.9	0.85	330.2	40.00
T_2	79.8	1.65	0.92	137.5	3.8	8.00	47.9	1.14	325.1	36.00
T_3	116.9	1.36	0.92	89.3	2.4	5.66	51.6	0.68	320.5	44.00
T_4	118.4	1.91	0.82	158.3	3.6	7.57	40.9	1.05	300.1	42.00
T_5	118.8	1.07	0.95	71.3	2.3	4.56	50.5	0.93	275.5	50.00
T_6	203.8	1.65	0.73	141.3	4.6	3.92	48.0	1.00	250.5	40.00
T_7	21.0	0.88	0.91	88.8	2.3	5.42	53.2	0.77	310.5	42.00
T_8	115.7	1.75	0.84	161.3	3.6	5.45	51.3	1.14	290.7	40.00
C.D. (P=0.05)		0.18	0.04	1.2	0.18		1.9			1.065

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