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Short Communication

VARIATION IN KERNEL CHARACTERS OF SEEDLING WALNUT TREES (*JUGLANS REGIA* L.) OF DIFFERENT AGES

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The kernel characters are of great economic importance in walnut. Kernels of walnut vary from relatively thin to very plump forms. It is desirable to have kernel which fill the nut cavity and should not be so tight that it becomes difficult to extract them from the nut. A well filled nut with some space remaining between the kernel and the shell is preferred.

The kernel characters are becoming increasingly important in view of the fact that in the international markets, increasing quantities of produce is going as kernel rather than in shell nut (Forde, 1975). Walnut in India is mostly grown in hilly areas and to transport the produce to main markets, involves heavy transportation cost. To overcome this, emphasis should be given to marketing of kernels instead of shell nut. Keeping in view the significance of the kernel characters in the present day marketing, it is essential to select walnut seedlings not only on the basis of nut characters but also or kernel characters. With these objectives, the studies were undertaken to study variation in kernel characters of seedling walnut trees of different ages. The present studies were conducted in 1995 and 1996 in Jaunaji area of district Solan in Himachal Pradesh (India) which is located at latitude 30°50'N and 77°8'E and elevation from 1400 to 1600 meters above mean sea level. Of a total population of 500 seedling walnut trees, 125 were selected on the basis of preliminary information obtained from the growers in different villages. The detailed observations were recorded on these 125 seedling trees which were scattered in 15 villages.

Data on kernel characters were recorded (UPOV, 1988). Thirty nuts were sampled from all sides of the tree for recording data for each tree. Data of metric characters were analysed statistically (Panse and Sukhatme, 1957).

RESULTS AND DISCUSSION

The data on kernel characters *viz.* - percentage, weight, length, width and breadth are presented in Table 1.

Table 1. Variation in kernel characters of different seedling walnuts of different ages

Kernel characters	Mean	Range	Coefficient of variation	Standard deviation	Standard error	Critical differences
Age Group 1 (Upto 20 years)						
Percentage	39.18	26.27-68.17	21.78	8.53	1.27	2.57
Weight (g)	4.15	2.34-6.31	19.99	0.83	0.12	0.25
Length (cm)	2.62	1.62-3.31	14.36	0.37	0.06	0.11
Width (cm)	1.93	1.04-3.25	15.74	0.30	0.04	0.09
Breadth (cm)	2.24	1.12-3.17	16.85	0.38	0.06	0.11
Age Group 2 (21-40 years)						
Percentage	38.05	20.67-59.24	19.63	7.47	1.11	2.25
Weight (g)	4.01	2.58-6.13	21.40	0.86	0.13	0.26
Length (cm)	2.59	1.72-3.11	12.38	0.32	0.05	0.10
Width (cm)	1.87	1.26-2.41	14.75	0.28	0.04	0.08
Breadth (cm)	2.30	1.12-2.99	18.21	0.42	0.06	0.13
Age Group 3 (above 40 years)						
Percentage	36.63	11.51-49.55	16.54	6.06	1.05	2.15
Weight (g)	4.10	1.38-6.26	23.17	0.95	0.16	0.34
Length (cm)	2.47	1.83-3.10	11.84	0.29	0.05	0.10
Width (cm)	1.91	1.19-2.59	15.12	0.29	0.05	0.10
Breadth (cm)	2.27	1.29-2.98	16.39	0.37	0.06	0.13

As far as ease to kernel removal is concerned, six trees had easily extractable nuts. Forty six tree were placed under easy, 45 under medium, 23 under difficult and 5 were under very difficult category. Intensity of colour was also studied; the kernel colour was dark in the nuts of 23 trees, very

dark in 7 trees, medium in 60 and very light colour in 35 trees. Kernel taste and flavour was adjudged by a panel of judges and depending upon the score out of 10 marks, the trees were categorised poor (5.5 and less), fair (5.6-7.0) and good (above 7.0). The kernels of 16 trees were having poor, 58 pair and 51 were of good quality in respect of taste and flavour.

The kernel characters vary considerably among 125 seedling walnut trees studied. The kernel percentage in the present studies ranged from 11.51 to 68.17, whereas the values were reported from 28.84 to 64.33 per cent by Chauhan and Sharma (1979) and 24.08 to 52.65 per cent by Sharma and Chauhan (1980). The kernel weight ranged from 1.38 to 6.31 g in the present study whereas Rathore (1984) reported to vary from 1.2 to 4.6 in an elevation study of 22 walnut accessions. Similar variation was also reported by many workers in respect of kernel characters (Nauriyal *et al.*,1970; Motiyal and Gilkar, 1970; Barton 1979; Komanich, 1980; Pandey and Sinha, 1984; Thakur, 1993). This variation in the present studies and as reported by earlier workers may be due to genetic differences in the make up of these seedling trees. Moreover, most of these characters are polygenically controlled and are greatly influenced by the environmental factors which are prevailing in different areas where such studies were conducted.

It revealed from present studies that the age of the tree has some influence, although it was inconsistent and inclusive in the present case. However, kernel percentage was diminished with the increase of age of the tree. Similarly Nenyukhim (1972) reported that the population of different ages showed the species to be very polymorphic. There was a clear tendency for the number of large nuts, weight and thickness of shell to diminish with the age.

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