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Research Note :

WILD APRICOT (*Prunus armeniaca* L.):SOURCE OF INCOME GENERATION IN TEHRI, UTTARAKHAND

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ABSTRACT: Agricultural crops and food products have several unique characteristics, which set them apart from engineering materials, and these properties determine the quality of the fruit. In addition, the determination of physical properties of agricultural materials is important to design machines and processes for harvesting, handling and storage of these materials and requires understanding for converting these materials into food and feed. The calculations revealed that 100kg seeds extract 14 litres oil with the help of seed breaker as well as oil expeller. It is also compiled that total expenditure by including packaging cost and label cost from 100 kg seed worth Rs. 2014/-. During the survey it was observed that wild apricot fruits grown in Tehri district at various altitudes may help the local people to select important and good set of genotypes with better fruit quality performances for growing at orchard area under modern cultural practices.

Keywords : *Agricultural materials, machines, beneficiaries, entrepreneurship.*

Agricultural crops and food products have several unique characteristics, which set them apart from engineering materials, and these properties determine the quality of the fruit. In addition, the determination of physical properties of agricultural materials is important to design machines and processes for harvesting, handling and storage of these materials and requires understanding for converting these materials into food and feed (Celik and Ercisli, 1).The wild apricot (*Prunus armeniaca* Linn.) is an important tree borne oilseed of mid hills and dry temperate regions of the country. Wild apricot belongs to the family Rosaceae and sub-family Prunoideae. In the Himalayan region of the country, local communities known it by different vernacular names viz. 'Chulli', 'Shara', 'Khurmani', 'Chulu', 'Aaroo', 'Zardhi', 'Khubani', 'Chuari', 'Kushmiaru', 'Chola' and 'Gurdulu'. In Punjabi, it is called as Hari, Sari and Chuli. The cultivated apricot has its origin in North-Eastern China, whereas, wild apricot appears to be indigenous to India.

Wild apricot locally called Chullu is found in the dry temperate regions of North-Western Himalayas particularly in the valleys of Jammu & Kashmir (especially Ladakh), Chenab; Kullu and Shimla regions of H.P. and Garhwal hills of Uttarakhand at altitudes up to 3000 m. In Kumaon region, wild apricot is found in all the three districts of Nainital, Almora and Pithoragarh. Pithorgarh district has maximum density of wild apricot tree in the Kumaon region. The wild apricot's stone/pits left after the operations usually possess no commercial value and are treated as waste, which otherwise is a good source of edible oil containing high amount of unsaturated fatty acids. Generally, apricot fruits comprise of 11.7-22.2% stones, which yield 30.7-33.7 % kernels, which may be both sweet as well as bitter in taste. Both types of kernels can be utilized for extraction of oil. Locally, the kernel oil from apricot (chulli),wild peach (behmi) and hard shelled walnut is already being used to a limited extent by the local tribals in some parts of the country for food, massaging and for other homemade remedies. Owing to the availability of these fruits in large quantity, there exists a good scope for its utilization for extraction of oil. It is one of the important multipurpose trees in the region under existing system of agro-forestry (Singh and Chaudhary, 2).

Observations recorded during survey period

Data revealed from the Table 1 that among 42 places of Tehri district at the altitude of 2250 m the wild apricot length (3.42 cm), at 1732 m the wild apricot width (3.23cm) and volume (19.90 g), at 1440m the wild apricot weight (8g) and at 1447m seed weight (2.73ml) of the wild apricot were found maximum. At the altitude of 1836 m the wild apricot length, width, volume, weight and seed weight were found minimum and maximum at 2250 m (fruit length 2cm), 1732 m (fruit width 1.98cm), 1440 m (weight 4g),1732 m (fruit volume 0.8ml) and 1447 m (seed weight) were found 3.42, 3.23, 19.90, 18 and 2.73, respectively. TSS at the altitude of 1830m, titratable acidity at 1834 m, TSS :

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acid at 1828 m , reducing sugar at 1632 m ,total sugars and sugar : acid at 1420m and ascorbic acid at 1834 m recorded minimum. TSS (19°B), titratable acidity (3.43%), TSS : acid ratio (8.30), reducing sugar (6.96%), total sugars (9.65%) , sugar : acid ratio (6.65) and ascorbic acid (13.73%) were noticed maximum at the altitude of 1321m, 1655m, 1311m, 1291m, 1291m, 1442m and 1617m, respectively.

Training and its impact on beneficiaries

Training is the acquisition of knowledge, skills, and competencies as a result of the teaching of vocational or practical skills and knowledge that relate to specific useful competencies. Training has specific goals of improving one's capability, capacity, productivity and performance. The training needs behavioural complex to improve the status of the trainee regarding particular issues or any specific skill.In this regard one of the project *i.e.* "Complete Utilization and Mass Multiplication of Wild Apricot" has made a remarkable progress since its implementation till March 2012.Oil of the kernel of wild apricot was one of the important item which had become the source of the business for the local people.

The calculations which were made for the oil given below:

Total Seed = 100Kg.

Seed breaker require one hour for breaking seeds which has 3HP (746) motors

Therefore,

Total electricity used = 3 × 746 watt

= 2238/1000 watt= 2.24 unit

= 2.24 × 3.35 Rupees

= 7.50 or 8.00 Rupees

Total salt used for 100kg seed + kernel

= 25 litre solution (20 litre water + 5 kg salt)

Cost of salt = 5 × 5 = ₹ 25

Total kernel recovery = 35 Kg

Oil expeller take 5 hours for extraction of oil which has 5 HP motor

Total electricity used = 5 × 746 watt

= 3730/1000= 3.73 unit

= 3.73X3.35= 12.5/hr. Or 13/hr

Total rupees = 13 × 5 = ₹ 65

Total oil recovery = 35×40/100 = 14 litre.

Total expenditure = 65+25+8 = ₹ 98

Per litre cost = 98/14 =7 per litre

Seed Cost = 100 × 15 = 1500

Electricity used = -73

Salt used = 5 × 5 = 25

Labour = =200

Total Expenditure = 1798

Per litre cost = 1798/14 = 128.42

10% Packaging Cost = 128.42 × 10/ 100

= 12.84/ Kg

2% Label Cost = 128.42 × 2/100

= 2.57/bottle

Total Expenditure = 129 + 13 + 3 = ₹ 145

For 14 litres

Total Expenditure = 1798

10% Packaging Cost = 180

2% label cost = 36

For 14 litres = ₹ 2014

(in 100kg seed)

It is observed from the calculations that 100kg seeds extracted 14 litres oil with the help of seed breaker as well as oil expeller. It is also compiled that total expenditure by including packaging cost and label cost from 100 kg seed worth ₹ 2014/-.

During the period of 2009, 42 entrepreneurs were made who started their work on wild apricot processing. Most of the entrepreneurs so far had started their work on oil extraction and sale but one entrepreneur has also started work on preparation of beverages and their sale. Out of 42 entrepreneurs developed so far, 60% used the facilities of the project, but kept the products for their own use, 33% sold seeds for cash earning, 5% extracted oil for sale and 2% opted both oil extraction for self use as well as that for sale. 03 were recognized as Star entrepreneurs. The

Table 1: Evaluation of diversity of naturally occurring wild apricot in Tehri district of Uttarakhand for fruit physico-chemical characteristics.

Name of Place	Altitude (m)	Fruit Length (cm)	Fruit Width (cm)	Fruit wt. g)	Fruit Volume (ml)	Seed Wt. (g)	TSS (^{0}B)	Acidity (%)	TSS/Acid	Reducing Sugar (%)	Total Sugar (%)	S ugar : acid Ratio	Ascorbic Acid	Colour
Dargi-1	1617	2.69	2.602	9.7	8	1.4	12	3.1	3.874	4.83	6.73	2.172	13.73	YO 23-B
Dargi-2	1655	2.706	2.454	11.054	12.498	1.5	13.4	3.43	3.906	4.39	6.552	1.912	12.6	YO 22-B
Dargi-3	1578	2.492	2.234	8.85	9	1.38	15.4	2.86	5.382	5.61	7.1	2.484	12.83	YO 23-B
Weed-1	1440	3.116	3.086	19.904	13.002	2.03	14.9	1.96	7.606	5.731	7.25	3.702	12.38	YO 22-C
Weed-2	1423	2.854	2.83	11.902	12.498	1.93	16.8	2.77	6.066	6.55	8.15	2.942	11.25	YO 22-B
Dargi-4	1652	2.916	2.852	13.096	13.004	1.85	15.6	2.86	5.456	5.614	6.79	2.376	11.032	YO 22-B
Dargi-5	1686	3.094	2.956	16.15	14.504	2.6	16.6	3.43	4.84	4.91	7.914	2.308	10.13	YO 23-B
Dargi-6	1657	3.268	3.142	16.134	17.502	1.75	13	1.96	6.63199	5.28	6.51	3.322	11.484	YO 24-B
Dargi-7	1620	2.49	2.488	11.304	10.504	1.45	13.9	3.18	4.372	5.994	7.429	2.338	12.146	YO 22-C
Dargi-8	1623	3.152	2.802	12.354	13.496	1.75	15.8	2.45	6.452	6.12	7.482	3.056	11.034	YO 23-C
Dargi-9	1617	2.494	2.494	11.704	13.004	1.45	15.6	2.29	6.814	6.71	8.29	3.622	12.598	YO 21-C
Dargi-10	1570	2.468	2.482	8.3	8.75	1.23	16.8	2.61	6.258	5.09	7.69	2.946	12.598	YO 23-C
Weed-3	1563	2.468	2.446	7.65	9	1.35	12.7	2.53	5.02	4.242	5.7	2.254	12.832	YO 23-B
Weed-4	1447	2.524	2.518	15.248	16.004	2.73	13	2.53	5.14	5.09	6.882	2.72	10.352	YO 23-B
Ranichauri1	1732	3.302	3.226	18.004	18	1.65	14.4	3.18	4.73	5.19	6.589	2.076	8.34	YO 24-B
Ranichauri2	1730	2.866	2.722	10.248	9	1.6	10.6	2.12	5	4.66	6.22	2.932	10.14	YO 22-B
Chokhal-1	1935	2.498	2.462	8.2	9.5	1.2	12.2	3.18	3.838	5.01	6.194	1.95	6.72	YO 25-B
Chupdiyalgaon-1	2018	2.782	2.718	10.548	12.004	1.23	12.7	3.1	4.096	4.91	6.52	2.102	7.442	YO 25-B
Chupdiyalgaon-2	2023	2.69	2.452	8.499	8	1.4	13.2	2.29	5.766	5.29	6.947	3.306	7.858	YO 24-B
Chupdiyalgaon-3	2048	2.808	2.892	12.384	13.002	1.7	12.7	2.53	5.02	5.09	6.73	2.662	9.561	YO 21-C
Chupdiyalgaon-4	2037	2.996	3.056	14.104	14.004	1.6	12.2	2.29	5.326	5.61	7.28	3.178	6.378	YO 24-A
Zadipani-1	2095	2.602	2.586	9.1	9	0.95	12	2.53	4.744	5.45	7.016	2.776	6.59	YO 24-B
Zadipani-2	2250	3.42	3.086	16.384	16.5	1.95	10	1.96	5.104	4.51	5.78	2.946	9.136	YO 23-B
Zadipani-3	2248	3.38	3.092	15.934	14.752	2.65	11	2.29	4.804	5.73	6.86	2.996	8.63	YO 22-A
Kanatal-1	2398	3.186	2.946	14.808	14.252	2.6	11.4	2.37	4.81	3.82	5.816	2.456	8.08	YO 21-B
Kanatal-2	2395	3.102	3.012	14.08	14.002	2.4	11.5	2.12	5.226	3.87	5.89	2.778	9.78	YO 24-B
Arakot-1	1830	3.066	3.136	14.454	16.504	1.73	13.7	3.02	4.538	5.56	7.71	2.554	10.196	YO 24-A
Hadum-I	1632	2.904	3.058	13.7	13.004	2.2	10.8	2.29	4.717	3.8	5.75	2.51	7.484	YO 24-A
Hadam-III	1420	3.056	3.02	14.204	15.004	2.35	12	3.02	3.974	4.174	5.512	1.826	8.839	YO 23-B
Kot-Maniyar-1	1442	2.976	2.968	13.402	11.748	1.6	13	1.96	6.632	5.29	7.15	6.648	8.002	YO 21-B
Kot-Maniyar-2	1440	2.85	2.99	13.326	11.5	2.05	14.6	3.34	4.372	6.88	8.1	2.426	8.196	YO 23-B
Kulogi-1	1336	2.696	2.562	8.55	8.2	1.5	14.4	3.1	4.646	6.39	7.654	2.468	9.996	YO 22-B
Kotigad-1	1284	2.782	2.732	8.4	8.5	1.5	12.2	1.96	6.224	5.5	7.32	3.732	8.122	YO 21-C
Kotigad-2	1291	2.576	2.912	9.6	11.5	1.48	18.2	3.18	5.724	6.96	9.652	3.034	8.997	YO 24-B
Dharkot-1	1311	2.54	2.42	7.85	8	1.5	19	2.29	8.298	6.55	8.884	3.88	9.122	YO 24-B
Dharkot-2	1337	2.654	2.324	8	8.5	1.3	15.2	2.56	5.896	5.06	6.708	2.602	7.894	YO 23-B
HC-1	1824	2.438	2.622	8.75	8.5	1.35	12	2.29	5.24	4.622	6.492	2.836	6.2	YO 23-C
HC-2	1830	2.914	2.794	13.204	11.602	1.53	13.4	2.85	4.702	5.61	7.016	2.46	6.2	YO 21-C
HC-3	1830	2.718	2.6589	9.88	9	1.4	9.8	2.53	3.872	4.662	5.91	2.336	7.124	YO 23-C
HC-4	1828	3.106	3.1	13.7	14.004	1.6	11	3.18	3.458	4.83	6.22	1.956	8.598	YO 25-B
HC-5	1834	2.612	2.434	7.25	7	1.08	11.8	1.88	6.278	5.71	6.732	3.578	5.918	YO 24-B
HC-6	1836	2.004	1.98	4.15	4	0.8	11.8	2.24	5.266	4.947	6.561	2.93	6.23	YO 23-B

YO = Yellow Orange, HC = Hill Campus

total products (apricot oil) sold were more than ₹ 56,636/-. Products worth more than ₹ 5000/- per month were sold by the entrepreneurs at the targeted sale point through the sale reached above ₹ 14000/- during June 2009. Apricot appetizers more than ₹ 40,000 were also sold at various sales outlets promoted under the project. Besides exploring potential of demand of wild apricot products in nearby local areas in Distt

Tehri, tourist places like Mussorie in distt Dehradun and Dhanaulti in Distt Tehri were targeted and a very good response was obtained.

During the period of September 2011 five trainings were conducted related to post harvest preparation of the wild apricot as an appetizer and oil with the help of its fruit and seed respectively.During the period observed that the village people were very excited to know about the various post harvest preparation of the fruit and seed .The people were unaware with the value of the fruit as they think of it as an indigenous tree which scattered all over the mountain areas. But after the training the local people was realized that the fruit and the seed both are very important as consumable items along with this a good source of income generation by establishing a small scale businesses in nearby areas.

With the remnants of the kernel of apricot the face scrub was also prepared along with the powder of orange peel worth ₹ 50 /- per packet calculated just from the beginning of its preparation till its packaging and tried to sell it in a local area but due to the closure of the project it was not very much commercialized.

CONCLUSION

During the survey it was observed that related to wild apricot fruits grown in Tehri district at various altitudes may help the local people to select important and good set of genotypes with better fruit quality performances for growing at orchard area under modern cultural practices. On the other hand, the data showed that the apricot fruits and seeds have a real potential usage in harvest, transportation, classification; processing, storing, packaging, drying and other processes and help the orchard owners and farmers in income generation through Self Help Groups or entrepreneur developed by their own. Unfortunately, due to fire in the forest areas lots of damage had been seen in every summer season during the period of project and then its was stopped by the month of March 2012. But, it was observed that if the project would have been carried out from the bird's eyeview it could be further lengthened for so many years to make the local people beneficiaries as entrepreneur from the various items of the apricot fruit with the help of the processing.

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