Performance of Some Almond Cultivars in the Pithoragarh Valley of Uttar-Pradesh, India

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The almond (*Prunus amygdalus* Batsch) has been in front rank among all the edible nuts in India and it has become so popular that the health of body-builders are oftenly associated with its amount present in their diets. Since a cool and dry climate is necessary for almond production, its cultivation has been restricted mostly to Kashmir. However, with the introduction of some good early maturing strains, there appear to be a potential for its production in North India even though prone to heavy mansoon by the end of June. Trials are presently in progress in Uttar Pradesh, Himachal Pradesh, Kashmir and Punjab (Thaper, 1960; Singh *et al.*, 1969; Dhatt & Gill, 1976; Jawanda *et al.*, 1977; Dhaliwal *et al.*, 1978; Jawanda, 1978) for screening suitable cultivars and ascertaining their potential. Studies on the performance of some important cultivars were done also at the Horticultural Research Station Pithoragarh (U.P.). The salient features of some of the results are described in this paper as a prelimnary report.

Materials and Methods

Eight cultivars (Non-pereil, California Paper Shell, Irani Special, Briggs Hard Shell, Kagzi Special, I.X.L., Brandis, and Jardonale) were obtained through Plant Introduction Division, I.A.R.I. New Delhi, and planted at 4 x 4 m in a randomized block design at the Horticultural Research Station, Pithoragarh (U.P.) during 1972-73. Trees came into bearing in 1976-77. Observations were recorded on their growth, bearing, and nut quality.

Results and Discussion

Growth, Flowering, Fruiting and Maturity

A wide variation was found in the time of blooming among the almond cultivars (Table 1). It varied from the end of the second week of February to the second week of March. Kagzi

Table 1. Vegetative growth and time of flowering, fruit setting and almond maturity at Horticultural Research Station, Pithoragarh (U.P.) India.

Almond cultivar	Mean height of plants (cm)	Mean girth (cm)		Mean spread (cm)	Mean bloom date 1980	Mean fruit setting date 1980	Mean maturity date 1980
		stock	scion				
Nonpereil	515	46.8	38.8	341	28 Feb.	6 Mar.	31 July
California Paper Shell	359	34.9	31.0	317	23 Feb.	6 Mar.	28 July
Irani Special	384	27.2	24.7	224	28 Feb.	7 Mar.	10 July
Kagzi Special	324	28.0	26.6	215	13 Feb.	28 Feb.	5 July
Briggs Hard Shell	356	27.0	19.6	155	8 Mar.	14 Mar.	26 July
I.X.L.	211	22.0	11.8	104	10 Mar.	18 Mar.	17 July
Brandis	253	14.8	13.3	148	12 Mar.	17 Mar.	12 July
Jardonale	150	7.6	6.6	69	15 Mar.	18 Mar.	12 July

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Table 2. Yield, physical and chemical fruit characters of almond cultivars.[1]

Cultivar	Mean no. of fruits per tree	Mean weight of fruits per tree (g)	Average fruit weight (g)	Fruit size		Kernel percent by nut weight	Kernel weight (g)	Kernel size		Shell quality	Remarks
				Length (mm)	Breadth (mm)			Length (mm)	Breadth (mm)		
Nonpareil	768	1427	1.6	27	18	57.5	0.99	21	13	Soft	35% double kernel
California Paper Shell	609	1024	1.4	35	17	80.2	1.20	25	12	Papery	20% double kernel
Irani Special	136	185	1.2	23	14	50.0	0.52	15	9	Semi-hard	single kernel
Kagzi Special	110	121	1.4	25	14	51.8	0.74	18	11	Soft	15% double kernel
Briggs Hard Shell	95	291	2.8	31	17	44.0	0.60	23	12	Hard	single kernel
I.X.L.	78	179	2.2	29	19	38.4	0.88	20	12	Semi-hard	single kernel
Brandis	36	44	1.4	27	16	53.0	0.76	19	11	Soft	single kernel
Jardonale	19	25	1.5	28	22	47.2	0.79	19	12	Soft	single kernel

[1]Mean of three years.

Special and California Paper Shell were the first to come into bloom, and this was over by the third week of March. Non-Pereil and Irani Special came into bloom by the end of February, and Briggs Hard Shell, I.X.L., Brandis, and Jardonale by the second week of March. The fruit setting period also varied ranging from the end of February to third week of March. In agroclimatic conditions of Pithoragarh Valley, the early blooming and fruit setting cultivar, e.g., Kagzi Special and Irani-Special, matured earlier than the other cultivars. Brandis and Jardonale matured in the second week of July, followed by I.X.L. The later maturing were California Paper Shell and Non-Pereil (Table 1). Jawanda *et al.* (1978) and Dhaliwal *et al.* (1978) also drew the same conclusions.

Nut Characteristics

The nut weight and size, kernel weight and size, kernel percentage, and shell type of the various cultivars differed among the cultivars (Table 2). The kernel content depends on the type of shell. Soft, semi-soft, and papery shelled strains had a higher kernel content on a nut weight basis. The lower percentage of kernel content of I.X.L., and Briggs Hard Shell (38.0 and 44.0%) were mostly due to their hard shells. This aspect has been reported also by Singh *et al.* (1977), and Jawanda *et al.* (1977-78).

Summary

Performances of eight almond cultivars introduced and raised at Horticultural Research Station, Pithoragarh (U.P.) were studied during 1972-80. California Paper Shell, Non-Pereil, Kagzi Special, and Irani Special were found to be the most suitable cultivars for successful cultivation in the Valley of Pithoragarh.

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Student Paper presented for 1983 U.P. Hedrick Award:

Black Ben Davis or Guno: A Question of Right, Truth and Justice[3]

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For two years at the turn of the century, a vehement argument raged across the Arkansas-Missouri border over the nomenclature of an apple. This battle called the "Gano-Black Ben Davis controversey," embroiled one of the country's largest nurseries (Stark Bros.) and the horticultural societies of what was then two of the nation's most important apple-producing states, Arkansas and Missouri. Profit, pride and patriotism were probably the motive forces behind the separate factions. The framework of the controversy was this: Arkansans contended that these were two distinct cultivars, while most of the Missourians claimed the two were the same. They also claimed "the right to name" based on the older and more-or-less traceable history of the Gano.

Although fought with only pens and tongues, the rhetoric at times was fierce; neither authority nor rules ever decisively concluded this war of words. To fully understand the debate, a little background is necessary.

In 1848 the American Pomological Society (APS) was formed, and, as one of its early actions, it adopted a code of nomenclature. Johnson (1949) listed the formulated code of nomenclature as one of the Society's major accomplishments in its first 100 years. Prior to that, no standardized rules of pomological nomenclature existed in the U.S. Naming was done haphazardly and arbitrarily, often without regard for origin, introducer, or even fruit characteristics. Theoretically, this code should have solved most subsequent nomenclature problems, but, as Zielinski (1955) claimed, "It is probably safe to say that not more than one fruit grower out of every thousand has ever seen it."

It was not uncommon for a cultivar to have more than one name, or for more than one cultivar to share the same name. Beach (1905) lists Ortley

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