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Short Note

Present status of apple pollinizers in Kullu valley of Himachal Pradesh - a case study

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Himachal Pradesh, a front ranking hilly state in the production of temperate fruits in India, grows more than one-third of the apple grown in the country (Singh *et al.*, 1999). Kullu valley in the north of Himachal Pradesh is famous for production of quality apples since the beginning of 20th century,

However, productivity (yield/ha) has been quite low (4.5 tons /ha) as compared to around 30 tons /ha in most developed countries. Inadequate pollination is being considered as one of the major factors of low productivity and renewed interest is being generated amongst the orchardists to ensure optimum pollination.

A survey was, therefore, undertaken in Kullu valley to ascertain the current status of pollinizers in apple orchards. The aim of the survey was to generate first hand information on type, proportion and placement of pollinizers in various orchards of Kullu valley in order to make corresponding recommendations to the orchardists for future plantations.

A field survey in major apple growing areas of Kullu - valley located at latitude 32°02; N and 77° E was conducted during 1996-97. Four apple orchards were selected randomly in each of the four locations, Bajaura (1097 m amsl), Raison (1463 m amsl), Parvati valley (1524 m amsl) and Naggar (1760 m amsl). The observations were recorded on number and age of trees of different cultivars, pollinizer cultivars, their placement, spacing and other related aspects.

The major findings are given in table 1 of the survey undertaken in 1996-97 with regard to the status of apple pollinizers in sixteen apple orchards in four locations of Kullu district.In most of the orchards, Jonathan, Golden Delicious, Black Ben Davis, Red Gold, Winter Banana and Commercial are interplanted as pollinizers for main cultivars viz. Royal Delicious, Red Delicious, Richared etc. In one orchard, related *Malus* species like *M.floribunda* and *M. robusta* have been included as pollinizers.

The proportion of pollinizers extended from zero to 60.39 per cent in all the orchards surveyed in Kullu valley with most having below the recommended level of pollinizers i.e. 33 per cent for an ideal apple orchard in Himachal Pradesh (Anonymous, 1996). However 11, 15, 20 and 33 per cent pollinizers are in vogue in the state in different planting plans (Verma *et al.*,1997). As many as in six orchards namely Vaidya Orchard, Khullar Orchard, Sharma Orchard, Budhi Orchard, Mann Orchard and Govind Orchard pollinizers proportion ranged from 19.92 to 27 per cent falling within the limits suggested by Verma *et al.*(1997), while it exceeded (60.39%) in Hira Orchard.

As regards placement of pollinizers, standard layout was not followed in any of the orchards. To ensure effective and maximum pollination, placement of pollinizers as every third row is recommended (Mayer *et al.*, 1985). Even the distance of pollinizer tree from main cultivar was quit variable as planting density varied from orchard to orchard, suggesting by and large, non-systematic planting. In order to obtain beneficial effects from pollinizer, their distance from main cultivars should be 10 to 20 meters (Hansen, 1980; Soltesz, 1997), which was found lacking in most of the orchards surveyed in Kullu valley.

On the whole, the survey suggests that inadequate level of pollinizers was present in some of the orchards and their placement was non-systematic in most of the orchards.

Table 1. Status of pollinizers and cultivars in apple orchards in Kullu valley of Himachal Pradesh

Location / Orchard	Age of plants (yrs)	Total number of plants	Pollinizer (%)	Aspect of orchard direction	Direction of wind	Cultivar / Pollinizers in planting plan	Spacing (m)
Bajaura (1097 m amsl)							
Hira Orchard	20	101	60.39	Western	North-South	Jonathan*,Black Ben Davis*, Royal Delicious and Ambri	Variable
Orchard of Deptt. of Horticulture	18	219	7.30	Northern	South-North	Royal Delicious, Mollie's Delicious, Golden Delicious* Tydeman's Early*	5x5
Orchard of Indo Italian Fruit Dev Project	10	230	6.70	Flat area	South-North	Summered, Royal Gala, Oregon Spur, Red Chief. *Malus floribunda**, *M.robusta**, and Crimson Gold*	4x4
Vaidya Orchard	20	147	12.92	Northern	East-West	Royal Delicious, Jonathan*, Golden Delicious*	5x5
Raison (1463 m amsl)							
Khullar Orchard	15	108	15.74	South-Western	North-South	Royal Delicious, Red Delicious Jonathan*, Red Gold*, Golden Delicious*, Richared,Black Ben Davis* and Commercial*	Variable
Negi orchard	15	123	2.43	Western	East-West	Royal Delicious, Jonthan* & Golden Delicious*	5x5
Sharma Orchard	25	102	27.45	Northern	East-West	Royal Delicious, Jonathan* Winter Banana*, Commercial*, Black Ben Davis*, Richared, Tydeman's Early*, Yellow Newton* and Golden Delicious*	Variable
Rakesh Orchard	20	103	9.70	Western	East-West	Royal Delicious, Red Delicious, Golden Delicious William's Royal Commercial*, Richared and Red Gold*	Variable
Parvati valley (Jari) (524 m amsl)							
Gopi Orchard	8	104	0.00	South-Western	North-South	Royal Delicious	Variable
Lotam Orchard	30	115	3.47	Western	East-West	Royal Delicious, Golden Delicious and Red Gold*	Variable
Mann Orchard	25	113	15.92	Eastern	East-West	Royal Delicious, Jonathan*, Red Delicious, Black Ben Davis*, Newfane, Winter Banana*, Golden Delicious* and Commercial*	Variable
Naggar (1760 m amsl)							
Mohar Orchard	35	119	7.56	Eastern	North-South	Royal Delicious, Red Delicious Commercial, * Golden Richared, Newfane and Jonathan*	Variable
Govind Orchard	30	109	17.42	Eastern	East	Royal Delicious, Richared Jonathan*,Red Delicious, Commercial, * Granny Smith*, Black Ben Davis* and Golden Delicious*	Variable
Aroma Orchard	8	103	9.70	Eastern	North-South	Royal Delicious, Crimson Gold*, Golden Delicious *, Oregon Spur, Red Chief, Red Spur and Tydeman's Early*	Variable
Desh Orchard	15	106	6.6	Eastern	North-South	Royal Delicious, Golden Delicious *	5x5

*Pollinizer

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