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EVALUATION OF CHERRY GERMPLASM

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Thirty seven cherry cultivars were introduced at Temperate Horticultural Research Station, Kotkhai (National Hortorium) during 1961 to 1965 out of which 20 are still existing in satisfactory condition of growth and productivity. Cultivar Triumph Domini was very good yielder which produced 46.0 kg fruit (cummulative yield of 1990-1992). This was followed by Pictroase Negre (10.700 kg) and Germersdorfer (10.450 kg). Triumph Domini was also earliest to ripe closely followed by Pictroase Negre and were early to the already recommended cultivar Seneca. These are bright to dark red in colour and sweet in taste. Triumph Domini, Bigarreau Noir Hative, Germersdorfer and Emperor Francis were almost free from shot hole leaf disease and all other cultivars had light to moderately high attack of the disease. Moderate to sever infestation of flat headed peach tree borer, *Sphenoptera lafertei* Thomson was noticed in most of the germplasm. However, trees of Triumph Domini, Bigarreau Noir Hative, Bedford Prolific-202, Pictroase Negre, and Early River were free from the ravages of the insect pest.

Key words : Cherry germplasm, evaluation, shot hole disease, peach tree borer

Cherry is the earliest fruit to come in the market. It is grown on small scale in Himachal Pradesh, Kashmir and Kumaon hills. The area under the fruit is only about 380 hectares (Srivastava, 1974). Main production is confined to Kashmir only, from where the fruits are sent to distant markets. Very limited plantations are also available in Shimla and Narkanda areas of Shimla district and Kullu area. The major limiting factor in its cultivation is absence of early ripening and self fruitful varieties. Prevalence of gummosis and leaf spot are main reasons in its decline. Presently available varieties are mostly mid season in ripening. To select promising cultivars of cherry, the existing germplasm at the station was evaluated for growth, yield, fruit quality, insect-pest and disease resistance. The observations reported in this paper would help in proper evaluation of this germplasm for selecting promising cultivars.

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MATERIALS AND METHODS

Thirty seven cherry cultivars were introduced at Temperate Horticultural Research Station, Kotkhai (National Hortorium) during 1961 to 1965 from which 19 cultivars belonging to *Prunus avium* group and one namely Suda Hardy of *Prunus cerasus* type are still exisiting in satisfactory condition of growth. Each cultivar comprising two trees, planted at eastern aspect of the station at an elevation of 1800m above sea level. The station is located in the Temperate Wet Zone of the state and is moderately suited for cherry cultivation. These trees were trained to modified centre leader system and cultural operations as well as manurial schedule for all the experimental trees were uniform. Observations on yield and fruit quality were recorded during 1990-1992.

Varieties were also studied for the incidence of flat headed peach tree borer (*Sphenoptera lafertei* Thomson) which is a serious pest of stone fruits and mainly responsible for gummosis in these fruit plants. Oozing of gum from the main trunk and limbs with elliptical adult emergence holes (old attack) were also considered. The attack was arbitrarily graded into five catagories on the basis of gum-oozing and adult emergence holes which are as : healthy (0), light (1 to 10), moderate (11- 30), heavy (21-30), very heavy (31-50) and severe (more than 50). Observations on shot hole disease attack were catagorized according to visual key depending upon the incidence and intensity of attack.

RESULTS AND DISCUSSION

The data on growth, yield, fruit quality and incidence of flat headed peach tree borer and shot hole disease are given in Table 1.

Trunk girth and tree height : Maximum tree growth in respect of girth (109 cm) was recorded in Bigarreau Severne which was followed by Bigarreau Noir Gross. Tree of Suda Hardy had minimum (58 cm) tree girth. Trees of Red Heart were more in vertical growth and Early River ranked second in this respect.

Yield : The data on cummulative fruit yield for 3 years (1990-92) revealed maximum yield of 46.0 kg in Triumph Domini. It was followed by Pietroase Negre (10.700 kg) and Germersdorfer (10.450 kg). All other cultivars yielded in very poor croping in Kotkhai conditions. Yield in cultivars like Emperor Francis, Boambe-De-cotnari, Pinkish Early, Sohmidt, White Heart Big Late was almost negligible. The performance of Triumph Domini was comparatively better in each year.

Maturity : Various cultivars are classified into different catagories according to ripening order in Table 2

Table 1 : Observations on tree growth, yield, quality and incidence of insect-pest and diseases of cherry germplasm

Cultivar	TG	TH	CFY	DH	AFW	TSS	LA	ISH
Red Heart	97.0	5.75	3.200	29/5	1.35	5.0	+	+
Black Heart	69.0	4.30	5.750	28/5	2.15	8.0	+	+
Napolean	80.0	5.00	3.800	25/5	2.31	10.0	+	+
Germrsdorfer	86.0	4.15	10.450	7/5	1.30	14.0	+	0
Early River	94.0	5.55	0.480	7/5	1.85	6.3	0	++
Early Purple	76.0	5.50	1.450	29/5	1.95	14.0	+	+
Schmidt	100.0	5.25	0.05	28/5	4/10	9.5	0	+
Pinkish Early	66.5	4.60	-	-	-	-	+++	+
Frogmore	91.0	5.45	-	-	-	-	+++	+
Suda Hardy	58.0	4.31	0.05	25/5	2.80	9.0	+++	+
Triumph Domini	87.0	5.40	46.00	30/4	2.35	6.0	0	0
Pietroase Negre	92.0	4.60	10.70	4/5	1.35	7.0	0	0
Emperor Francis	59.0	4.20	-	-	-	-	+	0
Bigarreau Noir Hative	91.0	5.10	1.60	29/5	2.35	10.0	0	0
Bigarreau Noir Gross	105.0	5.20	4.87	8/6	4.14	8.0	+	+
Guigne Noir Gross	74.0	4.80	2.65	10/6	2.50	10.0	+++	+
Bedford Prolific-202	104.0	5.90	1.26	20/5	1.70	4.0	0	+
Bigarreau Severne	109.0	5.20	2.25	7/5	1.40	7.0	++++	+
Boambe-De-Cotnari	60.0	4.35	-	-	-	-	++++	+
White Heart Big Late	76.0	5.40	-	-	-	-	0	+

0 Attack free, + Light, ++ Moderate incidence, +++ Heavy incidence, ++++ Very heavy/Severe incidence
TG = Trunk girth (cm), TH = Tree heght (m), CFY = Commulative fruit yield (1990-1992), DH = Date of Harvest (Date/Month), AFW = Average fruit weight (g), TSS = T.S.S. (Brix) %, LA = Level of attack of flat headed peach tree borer, ISH = Incidence of shot hole disease

Table 2 : Order of ripening of cherry gernplasm under Kotkhai conditions

Early season (Before May,5)	Early mid season (May 6-15)	Mid season (May 16-25)	Late mid season (May 25-June)	Late season (After June)
Triumph Domini	Germersdorfer	Bedford Prolific-202	Red Heart	Bigarreau Noir Gross
Pietroase Negre	Early River	Napolean	Schmidt	Guigne Noir Gross
	Bigarreau Severne		Black Heart	
			Buda Hardy	
			Early Purple	
			Bigarreau Noir Hative	

Triumph Domini cultivar started maturing in last week of April and was completely harvested in April or early May. Pietroase Negre was slightly late in ripening than the Triumph Domini. Three cultivars namely Germersdorfer, Early River and Bigarreau Severne two other varieties namely Napolean, and Bedford Prolific-202 were early mid season in ripening. Napolean was also reported to be late mid season by MAFF (1961).

Fruit size : There were large variations in fruit size of cherry cultivars and the average weight ranged from 1.30g to 4.14g. According to fruit weight, the cultivars can be classified into 3 groups. (Table 3).

Table 3 : Classification of cherry cultivars according to fruit weight

Small size (less than 2g)	Medium (2 to 4g)	Large (4 to 6g)
Germersdorfer	Black Heart	Schmidt
Pietroase Negre	Bigarreau Noir Hative	Bigarreau Noir Gross
Red Heart	Triumph Domini	
Early River	Napolean	
Early Purple	Suda Hardy	
Bigarrequ Severne	Guine Noir Gross	
Bedford Prolific-202		

Fruit colour : Cherry cultivars in the present study were found yellow to dark red and black in colour. According to colour the cultivars are classified in to following four groups (Table 4). Five cultivars did not produce any crop in last three years so could not be evaluated for this parameter.

Table 4 : Classification of cherry cultivars according to colour and appearance

Very attractive (dark red to black)	Attractive (Bright red)	Moderately attractive (Red blush on yellow background)	Fair (pale colour with red blush)
Black Heart	Red Heart	Germsdorfer	Early River
	Schmidt	Bigarreau Noir Gross	Suda Hardy
	Napolean	Bigarreau Noir Hative	
	Triumph Domini	Guigne Noir Gross	
	Pietroase Negre	Bigarreau Severne	
	Early Purple		

Fruit taste : Taste of fruit as adjudged by panel of experts, were classified as shown in Table 5.

Table 5 : Classification of cherry cultivars according to taste

Sweet of good quality	Subacidic but acceptable	Watery acidic fairly acceptable	Acidic and Bitter with poor quality
Bigarrequ Noir Cross	Early River	Germersdorfer	Napolean
Bigarreaau Noir Hative	Black Heart	Bedford Prolific-202	Suda Hardy
Red Heart	Guine Noir Gross		Bigarreau Severne
Triumph Domini			

Insect/pests : Moderate to severe incidence of flat headed peach tree borer was noticed on most of the cultivars. Trees of Early River, Schmidt, Triumph Domini, Pietroase Negre, Bigarreau Noir Hative, Bedford Prolific-202 and White Heart Big Late were free from the ravages of the insect pest. Gumming tendency was mainly associated with insect damage and trees planted at north eastern aspect were least affected. Heavy infestation of cherry by flat headed peach tree borer in Himachal Pradesh is reported by Sharma *et al.* (1990) as compared to other stone fruits and this is stated to be due to its open branches and less spread of its canopy.

Shot hole disease : Incidence of shot hole disease was also recorded and the catagorization was done on visual observations. Four cultivars namely Triumph Domini, Bigarreau Noir Hative, Germersdorfer and Emperor Francis were observed almost free of shot hole disease and all other cultivars had light to moderately high attack of the disease.

The disease in also known as cherry leaf spot which is caused by *Cocomyces hiemalis* and is world wide in its distribution. This may result in reduced shoot growth, reduction in fruit set and size, death of spurs in winter and even death of trees. Defoliation prior to ripening period is reported to reduce size and quality of fruit with uneven ripening and insipid taste (Anderson, 1956).

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