

Characteristics of Some Local and Standard Sweet Cherry Cultivars Grown in Turkey¹

LEYLA DEMIRSOY^{2, 3} AND HÜSNÜ DEMIRSOY²

Abstract

This study was carried out during 2000-2002 in Amasya, Turkey where cherry is grown widely. The objective of the study was to characterize pomological and phenological characteristics of 28 sweet cherry cultivars grown in Amasya. Flowering occurred between the second week of March and the third week of April. Ripening was between the third week of April and the second week of July. Local cultivars such as 'Türkoglu', 'Karakiraz', and 'Köröglü' ripened earlier and 'Barama', 'Karakirtik-2' and 'Geçkiraz' ripened later than the others. The largest fruits were obtained from '0900 Ziraat', 'Hacı Ali' 'Lambert', 'Van' and 'Bing'. Fruit, flower and leaf characteristics of these were also determined.

Introduction

The sweet cherry is apparently native in some parts of Northern Turkey (15). The earliest description of the cherry comes from Theophrastus in ca. 300 BC. The name that Theophrastus used for the cherry was kerosos. The Greek kerosia may have originated from the name of the town Kerasun on the Black Sea (possibly Giresun, today) and became the species name *cerasus* (18).

Turkey is second to Iran in worldwide cherry production with 200,000 metric tons; USA, Germany, Italy, Spain and Romania follow Turkey (7). Cherry is grown in provinces such as Kocaeli, Izmir, Samsun, Zonguldak in the Marmara, Aegean and Black Sea regions. It is also grown in some passageway regions between the Central Anatolia and the Black Sea region such as Amasya and Tokat (5). Amasya, between 39 and 40° N latitude, is one of the major cherry production centers in Turkey (6). Amasya has wide cherry genotype resources, with very different characteristics such as time of bloom, early and late ripening, and variable fruit quality. This study was conducted to describe cherry cultivars in Amasya. Similar studies were also carried out in Europe (9, 10, 11, 12, 24, 26, 28,

29), USA (23), Canada (20) and Turkey (17, 22, 25).

There are a lot of cherry genotypes and local cultivars in Turkey which is the origin of sweet cherry. There has been no comprehensive program on collecting, characterizing and evaluating these cherry resources in Turkey apart from a limited number of studies. Unfortunately, some of these gene resources have been replaced by standard cultivars due to their small fruits and therefore most are becoming extinct. Indeed, they may be gene resources in breeding studies for pest resistance, improved fruit quality and for extending the cherry season. In addition, these can be used for pollination and fertilization studies to solve incompatibility problems. There is no reported study evaluating the characteristics of sweet cherry grown in the North Anatolia. The aim of the present study, therefore, was to determine some characteristics of some local and standard cultivars of sweet cherry grown in its region of origin.

Materials and Methods

This study was carried out in 2000-2002 in Amasya and Merzifon, Turkey with 22 local and 6 standard cherry cultivars. The

¹This study was supported by TUBITAK (TOGTAĞ 2601)

²Ondokuz Mayıs University, Faculty of Agriculture, Department of Horticulture 55139 Kurupelit-Samsun, TURKEY

³ Corresponding Author: Dr. Leyla Demirsoy, e-mail: demirsoy@omu.edu.tr t

origins of standard cultivars were USA for 'Bing', 'Honey Heart' and 'Lambert' (3,4,14), Canada for 'Van' (3,14,19), Turkey for '0900 Ziraat' (2), Italy for 'Bella di Pistoia' (8) and Morocco for 'Early Burlat' (3). Origin of local cultivars is unknown; these were propagated by grafting by growers and likely belong to this region.

The elevations of Amasya and Merzifon are 412 and 755 m, respectively (6). These areas have a continental climate; the winters are cold, the summers are hot. Annual rainfall is about 334-724 mm; spring frosts are rare. In Amasya, sweet cherry orchards have a cultivar diversity; there is no collection orchard which includes all cultivars. Cherries are generally grown on mahaleb seedlings; cultural practices such as pruning, fertilization, and irrigation are similar to each other and at optimal levels in all orchards. We selected three healthy trees, on mahaleb, at a 7x7m spacing and 18-20 years of age, for each cultivar from nine orchards.

The tree shape and vigor were rated as described by Schmidt et al. (27). Date of first bloom was recorded as the day when 10% of the flowers were open; full bloom date was recorded as the day when 90% of the flowers were open; the time of ripening was estimated from the skin color of the fruit as to Christensen (10). Fruit characteristics were determined for 50 fruit samples from those picked at random from selected trees. Fruit shape, skin color, flesh color and juice color were determined as described by Schmidt et al. (27). Fruit weight, fruit dimensions (breadth, thickness, length), stalk length, stalk thickness, pit weight and flesh/pit ratio were determined. Fruit firmness was measured on both cheek sides of the fruit with a penetrometer (FHR-5, Fruit Hardness Tester) with a 4.5 mm diameter spherical tip. TSS (total soluble solids), acidity (as equivalent of malic acid) and juice pH were measured. Fruit juiciness and stone shape were determined as by Anonymous (1). With 50 flowers and leaves, flower and leaf characteristics such as calyx and corolla diameters, flower color, number of pistils and

anthers, leaf blade width and length, leaf stalk length, leaf gland shape and predominant number of glands were determined as by Anonymous (1).

Results and Discussion

The tree shapes were characterized as spreading, semi-upright or upright and tree vigor was classified as vigorous or medium vigor (Table 1). In 2001-2002, the first bloom date was in the second half of March; full bloom varied from the third week of March to the third week of April. The earliest flowering were 'Turkoglu' and 'Karakiraz' followed by 'Early Burlat', 'Izmit', 'Çavusayse' and 'Köroglu' in 2001. In 2002, the first flowering was 'Turkoglu' followed by 'Karakiraz' and 'Köroglu' (Table 1). Ripening was between the third week of April and the second week of July. The earliest ripening was 'Turkoglu' followed by 'Karakiraz', 'Köroglu' and 'Tabaniyarik' while the latest ripening was 'Geçkiraz' in 2000 and 2001. The cultivars grown in Merzifon bloomed and ripened relatively later than those in Amasya. However, ripening time of the cherry cultivars changed from year to year. 'Türkoglu', 'Karakiraz', 'Köroglu' and 'Tabaniyarik' ripened 37 to 48, 32 to 43, 25 to 35 and 21 to 32, days respectively before 'Bing' while 'Geçkiraz' ripened 26 to 29 days after 'Bing' in 2000-2001. Lang et al. (23) reported that 'Chelan' (early new cv.) ripened 10-12 days before 'Bing' in USA. In Spain, Southern Italy and Greece, the main sweet cherry cultivars ripen between early May and early June while in Scandinavia the sweet cherry season extends from the end of June until mid August (13). Seven local cultivars described in Tokat ripened between July and June (17). According to our results, Amasya has a range of cultivars which cover a wide harvest season. Although their fruits are small, the earlier cultivars such as 'Türkoglu', 'Karakiraz', 'Köroglu' and 'Tabaniyarik' are economically important because of early ripening.

The average fruit weight varied from 2.8 to 8.9 g in 2000-2001 (Table 2). '0900 Ziraat', 'Lambert', 'Van' and 'Kargayüre-

Table 1. Tree shape, vigor and the flowering and ripening times of 28 sweet cherry cultivars evaluated in Amasya.

Cultivars	Shape of tree	Tree vigor	First bloom		Full bloom		Ripening Time			
			2001	2002	2001	2002	2000	2001	days- or + Bing	days- or + Bing
Türkoglu	Semi-upright	Medium	15 March	15 March	20 March	23 March	15 May	-37	23 April	-48
Karakiraz	Semi-upright	Medium	15 March	18 March	20 March	24 March	20 May	-32	28 April	-43
Köroglu	Semi-upright	Medium	19 March	18 March	23 March	28 March	27 May	-25	6 May	-35
Tabaniyarik	Semi-upright	Medium	26 March	24 March	29 March	2 April	31 May	-21	9 May	-32
Early Burlat	Semi-upright	Vigorous	17 March	20 March	20 March	2 April	10 June	-11	14 May	-27
Izmit	Spreading	Medium	18 March	24 March	22 March	3 April	12 June	-9	14 May	-27
Çavus Ayse	Upright	Vigorous	19 March	20 March	23 March	28 March	31 May	-21	21 May	-20
Hüsenba	Upright	Vigorous	20 March	20 March	24 March	28 March	31 May	-21	21 May	-20
Kargayüregi	Spreading	Medium	22 March	23 March	26 March	30 March	5 June	-16	21 May	-20
Abdullah	Semi-upright	Medium	22 March	28 March	25 March	4 April	12 June	-9	22 May	-19
Hafiz Ahmet	Spreading	Medium	22 March	28 March	25 March	4 April	12 June	-9	22 May	-19
Van	Upright, spreading	Vigorous	22 March	26 March	26 March	3 April	5 June	-16	5 June	-5
Arap	Semi-upright	Vigorous	22 March	25 March	26 March	2 April	12 June	-9	5 June	-5
Oto Batmaz	Spreading	Vigorous	20 March	21 March	23 March	26 March	12 June	-9	5 June	-5
Lambert	Upright, spreading	Vigorous	23 March	25 March	27 March	7 April	20 June	-1	5 June	-5
Haci Ali	Spreading	Medium	24 March	25 March	27 March	31 March	12 June	-9	10 June	0
Bing	Upright, spreading	Medium	22 March	25 March	26 March	4 April	21 June	0	10 June	0
Çavdarali	Semi-upright	Vigorous	1 April	1 April	6 April	7 April	4 July	+13	17 June	+7
Bella Di Pistoia	Semi-upright	Vigorous	24 March	31 March	28 March	4 April	20 June	-1	10 June	0
Karakirtik-1	Upright	Vigorous	29 March	30 March	3 April	4 April	18 June	-3	18 June	+8
Barama	Spreading	Vigorous	26 March	10 April	29 March	18 April	4 July	+13	23 June	+13
0900 Ziraat	Spreading	Vigorous	29 March	29 March	3 April	6 April	5 June	-16	13 June	+3
Karakirtik-2	Upright	Vigorous	29 March	31 March	3 April	6 April	4 July	+13	28 June	+18
Merzifon										
Eraslama	Upright	Vigorous	28 March	1 April	6 April	7 April	21 June	0	10 June	0
Pasa	Semi-upright	Medium	29 March	1 April	6 April	7 April	20 June	-1	10 June	0
Geçaslama	Spreading	Medium	29 March	9 April	6 April	18 April	4 July	+13	23 June	+13
Ankara Kirazi	Spreading	Medium	24 March	30 March	27 March	3 April	21 June	0	13 June	+3
Geçkiraz	Semi-upright	Vigorous	30 March	1 April	7 April	18 April	17 July	+26	9 July	+29

Table 2. Fruit weight, dimensions and firmness of 28 sweet cherry cultivars evaluated in Amasya.

Cultivars	Average Fruit		Fruit Dimensions						Firmness
	Weight (g)		Breadth (mm)		Thickness (mm)		Length (mm)		Penetrometer Values (kg)
	2000	2001	2000	2001	2000	2001	2000	2001	
Türkoglu	3.5	3.8	18.3±0.2	19.1±0.2	16.0±0.2	17.3±0.2	17.1±0.2	18.3±0.2	0.5±0.1
Karakiraz	3.3	3.1	18.3±0.2	18.5±0.2	15.1±0.2	15.2±0.2	17.3±0.2	17.2±0.2	0.5±0.1
Köroglu	5.0	4.9	20.6±0.3	20.6±0.3	17.8±0.2	17.6±0.2	20.3±0.3	19.4±0.3	0.3±0.0
Tabaniyarık	4.7	4.5	22.2±0.5	19.8±0.3	18.2±0.4	17.1±0.2	19.9±0.4	18.8±0.2	0.5±0.1
Early Burlat	-	6.7	-	23.8±0.4	-	19.2±0.4	-	20.7±0.3	0.6±0.1
Izmit	4.3	5.2	18.3±0.4	20.5±0.4	15.5±0.4	16.8±0.3	16.4±0.4	18.4±0.2	0.9±0.1
Çavus Ayse	4.7	4.6	21.0±0.3	19.9±0.2	17.4±0.2	16.5±0.2	17.6±0.2	17.5±0.2	0.6±0.1
Hübensa	3.8	3.9	19.4±0.2	18.9±0.2	16.1±0.2	16.1±0.2	17.6±0.2	17.9±0.2	0.5±0.0
Kargayüregi	7.4	5.0	22.6±0.3	20.5±0.3	19.1±0.2	17.4±0.2	22.0±0.3	20.5±0.3	0.7±0.1
Abdullah	-	4.4	-	18.2±0.3	-	15.4±0.2	-	16.7±0.2	0.5±0.1
Hafiz ahmet	5.2	4.5	23.7±0.3	20.2±0.2	20.3±0.3	16.9±0.2	22.0±0.3	18.4±0.1	0.6±0.1
Van	7.6	5.8	25.4±0.4	23.1±0.3	21.0±0.5	19.6±0.2	22.1±0.3	19.8±0.3	0.9±0.1
Arap	6.4	7.6	23.2±0.4	24.8±0.3	19.7±0.3	20.1±0.3	20.1±0.3	21.6±0.2	0.8±0.1
Oto Batmaz	5.1	5.5	21.3±0.2	22.1±0.2	18.3±0.2	19.1±0.5	18.2±0.2	19.3±0.2	0.7±0.1
Lambert	7.9	8.7	24.2±0.3	25.2±0.3	20.5±0.2	21.9±0.3	23.5±0.3	24.8±0.3	0.5±0.0
Haci Ali	6.2	8.5	22.7±0.3	25.5±0.4	19.1±0.2	20.5±0.3	20.6±0.2	22.9±0.4	0.7±0.1
Bing	6.8	7.6	24.1±0.4	25.1±0.3	20.1±0.3	20.3±0.2	21.1±0.2	21.8±0.3	0.9±0.0
Bella Di Pistoia	5.2	5.8	21.9±0.4	22.4±0.4	18.3±0.3	18.6±0.3	19.6±0.3	19.8±0.3	0.7±0.1
0900 Ziraat	8.9	8.3	26.6±0.3	25.7±0.3	21.8±0.2	21.7±0.2	24.1±0.3	23.6±0.2	0.9±0.1
Çavdar Ali	6.5	4.5	22.4±0.4	20.1±0.2	19.4±0.3	18.0±0.3	21.4±0.4	19.4±0.2	0.9±0.1
Karakirtik-1	5.1	5.5	20.7±0.4	21.5±0.3	17.0±0.3	18.6±0.2	18.4±0.3	21.5±0.2	0.9±0.1
Barama	4.6	3.7	20.1±0.4	18.4±0.2	17.0±0.4	16.4±0.2	18.5±0.5	18.4±0.2	0.9±0.1
Karakirtik-2	4.3	5.1	19.9±0.4	21.2±0.2	16.7±0.3	18.9±0.2	17.8±0.4	20.0±0.2	1.0±0.1
Merzifon									
Er Aslama	4.3	2.7	19.0±0.3	16.0±0.2	16.6±0.3	14.3±0.2	19.6±0.3	16.2±0.2	0.5±0.0
Pasa	4.8	3.9	20.6±0.3	19.8±0.9	17.1±0.2	16.4±0.7	17.5±0.3	17.6±0.2	0.6±0.1
Geç Aslama	3.9	3.8	19.6±0.2	19.1±0.2	17.0±0.3	16.4±0.2	18.9±0.2	19.0±0.2	0.7±0.1
Ankara Kirazi	3.0	4.3	16.7±0.3	18.7±0.3	14.7±0.2	16.9±0.3	15.4±0.2	17.6±0.3	0.5±0.0
Geçkiraz	4.9	5.1	21.2±0.3	20.9±0.3	18.0±0.2	17.8±0.2	18.3±0.2	17.6±0.3	1.2±0.1

Table 3. Soluble solids, acidity, pH, fruit juiciness, fruit stalk length and thickness, stone shape, stone weight and flesh/pit ratio of 28 sweet cherry cultivars evaluated in Amasya.

Cultivars	Soluble solids (%)		Acidity (%)		pH	Fruit juiciness ²	Fruit stalk length (cm)		Fruit stalk thickness (mm)	Stone shape	Stone weight (g)		Flesh / pit ratio	
	2000	2001	2000	2001			2000	2001			2000	2001	2000	2001
Türkoglu	11.0	10.0	0.6	0.6	3.8	2	3.7±0.1	4.1±0.1	1.0±0.0	Round	0.2	0.3	11.2	15.3
Karakiraz	14.7	13.0	0.7	0.5	4.1	2	3.3±0.1	3.6±0.1	0.9±0.0	Round	0.2	0.2	13.4	13.9
Köroglu	19.0	15.0	0.9	0.7	4.1	2	3.6±0.1	3.2±0.1	1.1±0.0	Broad elliptic	0.4	0.4	11.5	12.6
Tabaniyarik	10.8	17.2	0.8	0.6	3.9	2	3.4±0.1	4.0±0.1	1.2±0.0	Broad elliptic	0.4	0.3	10.3	12.1
Early Burlat	-	10.8	-	0.6	3.9	2	-	3.0±0.1	1.2±0.0	Broad elliptic	-	0.4	-	14.9
Izmit	12.0	15.0	0.7	0.9	3.9	2	3.6±0.1	4.4±0.1	0.9±0.0	Round	0.3	0.3	15.8	14.8
Çavus Ayse	11.1	12.4	0.3	0.5	4.2	2	4.6±0.2	4.3±0.2	0.9±0.0	Round	0.3	0.3	16.3	14.2
Hüsenba	10.8	16.8	0.4	0.6	4.4	2	3.9±0.1	4.9±0.1	0.9±0.0	Narrow elliptic	0.3	0.3	11.8	14.6
Kargayüregi	14.0	16.4	0.6	0.5	3.9	2	3.5±0.1	4.4±0.2	0.8±0.0	Broad elliptic	0.4	0.4	18.4	13.1
Abdullah	-	12.2	-	0.6	3.9	2	-	3.9±0.2	1.0±0.0	Round	-	0.4	-	10.8
Hafiz Ahmet	15.0	13.1	0.7	0.6	3.9	2	3.2±0.1	4.3±0.2	0.9±0.0	Round	0.4	0.5	13.7	9.0
Van	15.8	16.2	0.8	0.9	3.9	2	2.1±0.7	2.7±0.1	1.0±0.0	Round	0.3	0.3	22.0	16.4
Arap	14.6	17.5	0.7	0.8	3.8	3	3.4±0.2	3.6±0.2	1.1±0.1	Round	0.4	0.5	13.6	15.5
Oto Batmaz	15.2	16.5	0.5	0.7	4.1	2	3.2±0.1	4.3±0.2	0.9±0.0	Round	0.3	0.4	14.5	14.5
Lambert	17.0	15.4	0.6	0.9	3.7	2	3.7±0.1	4.7±0.2	1.1±0.0	Narrow elliptic	0.4	0.4	19.2	19.2
Haci Ali	15.8	16.0	0.5	0.9	3.9	2	3.3±0.1	3.6±0.1	1.4±0.1	Round	0.4	0.5	15.3	16.6
Bing	11.8	17.2	0.7	0.9	3.7	2	2.8±0.1	4.0±0.1	1.1±0.0	Round	0.4	0.4	15.6	17.6
Çavdar Ali	18.1	17.4	0.6	0.5	3.7	1	4.6±0.2	3.8±0.1	1.1±0.0	Narrow elliptic	0.3	0.3	18.8	13.1
Bella Di Pistoia	18.0	17.6	0.8	0.9	3.7	2	3.4±0.1	3.3±0.1	1.1±0.0	Round	0.3	0.3	17.4	17.3
Karakirtik-1	11.6	18.2	0.6	0.8	3.9	3	3.7±0.1	3.9±0.1	1.1±0.0	Narrow elliptic	0.4	0.3	12.1	20.2
Barama	14.6	17.9	0.4	0.5	4.0	2	3.2±0.1	4.0±0.1	1.0±0.0	Narrow elliptic	0.3	0.2	15.5	15.0
0900 Ziraat	16.2	17.0	0.5	0.8	3.7	2	3.9±0.7	3.9±0.3	1.1±0.0	Round	0.4	0.4	21.7	22.1
Karakirtik-2	13.8	15.5	0.7	1.0	3.8	1	3.8±0.1	4.1±0.2	1.0±0.0	Round	0.3	0.4	12.1	12.0
Merzifon														
Er Aslama	17.0	19.4	0.3	0.6	4.4	2	4.2±0.1	3.8±0.1	0.9±0.0	Round	0.3	0.2	12.9	13.5
Pasa	14.2	19.2	0.4	1.0	3.9	2	3.4±0.1	3.2±0.1	0.9±0.0	Round	0.3	0.3	13.0	12.3
Geç Aslama	16.0	16.4	0.5	0.8	3.9	2	3.5±0.1	3.8±0.1	0.8±0.0	Narrow elliptic	0.3	0.3	13.6	12.7
Anakra Kirazi	14.9	21.2	0.4	0.7	4.1	2	2.8±0.1	2.9±0.1	0.9±0.0	Round	0.2	0.4	11.9	8.2
Geçloraz	20.8	19.4	0.9	1.7	4.1	1	3.8±0.1	3.1±0.7	0.9±0.0	Round	0.4	0.4	10.9	12.3

²: Fruit juiciness: 1=weak, 2=medium, 3=strong

gi' produced larger fruits than 'Bing' in 2000. In 2001, 'Lambert', 'Haciali' and '0900 Ziraat' produced larger fruits than 'Bing'. '0900 Ziraat' is the most important cherry cv. for Turkey with high quality, firm, sweet, crisp and crack resistant fruit (16,21) and it is exported. The trees of '0900 Ziraat' produce large fruit (8.9 g in 2000, 8.3 g in 2001). Similar results were found by Demirsoy (16) as 8.2 g in 1994 and 9.0 g in 1995. Its fruit may reach to 9-10 g under good conditions and on clonal rootstocks such as Gisela 5 or Mazzard F/12. The largest fruits among the earlier cultivars were from 'Early Burlat'. 'Arap', one of the major local cv. in Amasya, also produced large fruits. Christensen (10) re-

ported that fruit weights varied from 4.7 to 9.7 g in 41 sweet cherry cultivars in Norway. Rusterholz et al. (26) reported that fruit weights varied from 5.5 to 9 g in new promising sweet cherry cultivars in Switzerland. The studies carried out on new cultivars in Canada (20) showed that fruit weights varied from 8.7 to 12.7g. In Turkey, it was reported that fruit weights varied from 2.8 to 4.5 g in some local cherry cultivars in Tokat (17) and 8.1 to 9.8 g in Middle Taurus Mountains (22). According to our results, fruit weights of the local cultivars in Amasya were similar to those in Tokat (Turkey), in Norway and Switzerland while they were smaller than those in Canada and the Taurus mountains. Local

Table 4. Fruit shape, skin color, flesh color and fruit juice color of 28 sweet cherry cultivars evaluated in Amasa.

Cultivars	Fruit shape	Fruit skin color	Fruit flesh color	Fruit juice color
Türkoglu	Kidney	Bright red	Pink	Red
Karakiraz	Flat round	Dark red	Pink	Dark pink
Köroglu	Cordate	Bright red on a yellow ground	Cream-white	Cream yellow
Tabaniyarik	Kidney	Dark red	Red	Pinkish red
Early Burlat	Kidney	Brown red	Light pink	Red
Izmit	Cordate	Bright dark red	Red	Red
Çavus Ayse	Flat round	Bright red	Pink	Pink
Hüsenba	Flat round	Bright red on a pale yellow ground	Cream-white	Cream yellow
Kargayüregi	Cordate	Red	Cream-white	Red
Abdullah	Flat round	Brown red	Pink	Red
Hafiz Ahmet	Flat round	Bright dark red	Pink	Pink
Van	Kidney	Dark red	Pink	Pink
Arap	Kidney	Red	Light pink	Pink
Oto Batmaz	Flat round	Red on a light yellow ground	Cream-white	Cream yellow
Lambert	Cordate	Bright brown red	Red	Light pink
Haciali	Kidney	Dark red	Red	Red
Bing	Kidney	Brown red	Red	Purple
Çavdarali	Elongate	Pinkish on a cream-yellow ground	Cream-white	Cream yellow
Bella Di Pistoia	Kidney	Red on a yellow ground	Cream-white	Cream yellow
Karakirtik-1	Cordate	Bright claret red	Dark pink	Purple
Barama	Elongate	Pinkish on a cream-yellow ground	Cream-yellow	Cream yellow
0900 Ziraat	Cordate	Brown red	Cream-white	Pink
Karakirtik-2	Flat round	Claret red	Cream-white	Pink
Merzifon				
Eraslama	Elongate	Pinkish red on a yellow ground	Yellow	Cream yellow
Pasa	Kidney	Red on an orange-yellow ground	Cream-white	Cream yellow
Geçaslama	Elongate	Red on a yellow ground	Cream-white	Cream yellow
Ankara Kirazi	Flat round	Bright light red	Cream-white	Cream yellow
Geçkiraz	Kidney	Red on an orange ground	Cream-white	Cream

Table 5. The flower and leaf characteristics of 28 sweet cherry cultivars evaluated in Amasya.

Cultivar	Flower color	Calyx diameter (mm)	Corolla diameter (cm)	Number of pistils	Number anthers	Leaf blade width (cm)	Leaf blade length (cm)	Leaf stalk length (cm)	Gland shape	Predominant number of glands
Türkoglu	Pinkish-white	5.7±0.2	3.0±0.3	1	37.4±0.6	5.8±0.1	11.9±0.3	3.5±0.2	Kidney	2, almost 0-1
Karakiraz	White	4.9±0.1	2.9±0.1	1	28.1±0.7	5.1±0.2	10.0±0.3	3.2±0.1	Kidney	2, almost 0,1
Köroglu	White	5.0±0.1	3.2±0.1	1	29.2±0.3	6.2±0.2	11.1±0.2	3.2±0.1	Kidney	2
Tabaniyarik	Light pink	4.8±0.2	3.4±0.1	1	32.3±0.8	6.8±0.2	12.8±0.4	3.6±0.1	Kidney, almost round	1-2
Early Burlat	White	6.5±0.1	4.3±0.1	1 - 2	31.8±1.2	6.2±0.3	13.9±0.9	4.3±0.3	Kidney-round	1 - 2
Izmit	White	3.7±0.1	3.5±0.1	1	32.7±1.3	4.7±0.2	10.0±0.5	3.3±0.2	Round, almost kidney	2, almost 1-3-4-5
Çavus Ayse	White	4.0±0.1	3.7±0.0	1	30.1±0.8	6.3±0.2	12.2±0.7	3.7±0.2	Kidney-round	2, almost 0 - 1
Hüsenba	Pinkish-white	6.5±0.1	3.5±0.1	1	36.1±0.7	5.1±0.2	9.7±0.4	3.1±0.3	Kidney	2, almost 0 - 1
Kargayüregi	Pinkish-white	5.6±0.1	3.6±0.1	1	35.7±0.8	6.6±0.2	15.1±0.6	3.7±0.1	Kidney	2, almost 0
Abdullah	Pinkish-white	4.0±0.1	3.6±0.1	1	32.5±1.1	6.7±0.3	20.5±0.8	4.3±0.2	Kidney-round	2, almost 1
Hafiz Ahmet	Pinkish-white	5.1±0.2	3.2±0.1	1*-2	34.5±1.2	5.4±0.1	12.9±0.5	4.3±0.1	Kidney, almost round	2, almost 0-1
Van	Transparent-white	6.1±0.2	3.3±0.1	1	35.6±0.7	6.9±0.3	15.0±0.4	3.5±0.2	Round-kidney	2, almost 1 - 3
Arap	White	3.7±0.1	3.2±0.1	1	32.4±0.9	7.8±0.2	16.2±0.4	3.9±0.1	Kidney-almost round	2, almost 0-1-3
Oto Batmaz	Light pink	3.5±0.1	3.3±0.1	1	26.5±1.2	4.8±0.2	11.7±0.5	3.7±0.2	Round-kidney	1-2
Lambert	White	6.9±0.1	3.7±0.1	1	31.3±0.9	5.6±0.2	11.5±0.3	3.8±0.1	Kidney-round	2, almost 1
Haci Ali	Pinkish-white	5.6±0.2	3.1±0.1	1*- 2	32.0±1.0	7.5±0.3	18.1±0.4	3.8±0.2	Kidney-round	2, almost 1-3
Bing	Pinkish-white	3.5±0.1	3.2±0.0	1	30.2±1.0	5.8±0.3	15.6±0.5	3.6±0.2	Round-kidney	2, almost 1
Çavdarali	Dull white	5.4±0.2	3.3±0.1	1	36.1±1.2	7.7±0.2	15.7±0.5	4.5±0.2	Kidney-round	2, almost 0 - 1
Bella Di Postoia	Dull white	3.5±0.1	3.3±0.1	1	34.6±1.5	4.9±0.2	10.0±0.5	4.1±0.2	Kidney-round	1 - 2
Karakirtik-1	Transparent-white	6.3±0.2	3.9±0.1	1	35.5±0.8	5.7±0.3	12.0±0.6	4.1±0.2	Kidney, almost round	1 - 2 - 3
Barama	Dull white	4.1±0.2	3.3±0.1	1	25.1±0.3	6.1±0.2	12.6±0.3	3.7±0.1	Kidney	1-2, almost 0
0900 Z iraat	Transparent-white	5.7±0.1	2.9±0.1	1	35.0±0.9	5.9±0.2	12.8±0.4	4.4±0.2	Kidney-round	2, almost 1 - 3
Karakirtik-2	Dull white	6.0±0.1	3.6±0.1	1	36.1±0.8	8.3±0.2	16.4±0.5	4.4±0.2	Kidney, almost round	2, almost 1 - 3
Merzifon										
Eraslama	White	5.7±0.1	3.1±0.1	1	33.5±1.1	5.4±0.2	10.1±0.4	2.7±0.1	Kidney	2, almost 1 - 3
Pasa	White	6.1±0.1	3.5±0.1	1	33.4±1.3	5.4±0.2	11.8±0.4	3.6±0.1	Kidney	2, almost 0 - 1
Geçaslama	Pinkish-white	4.3±1.2	2.7±0.1	1	24.4±0.9	5.1±0.1	9.9±0.4	3.1±0.2	Kidney-round	2, almost 0-1-3-4
Ankara Kirazi	Light pink	4.6±0.2	2.8±0.1	1	34.4±1.0	5.1±0.1	10.7±0.4	2.9±0.2	Kidney-round	2, almost 1 - 3
Geçkiraz	White	4.7±0.1	3.1±0.1	1	26.7±0.8	7.3±0.2	12.7±0.6	3.2±0.1	Kidney	1-2

*usually

cultivars in Amasya are preferred by some cherry processing companies to use in the chocolate and confectionary industry due to their small fruits. Fruit dimensions are presented in Table 2. 'Geçkiraz', 'Karakirtik-2' and 'Izmit' produced firmer fruits than 'Bing'. Fruit firmness of '0900 Ziraat' and 'Karakirtik-1' were similar to 'Bing'. 'Van' and 'Barama' were near to 'Bing' in terms of firmness (Table 2). The fruit of 'Izmit' is very firm, so it can remain on the tree for 15 days. It is suitable for long distance transport. In addition, data on fruit shape, skin color, flesh color and juice color of all cultivars evaluated are given in Table 3.

In 2000, TSS of all cultivars were higher than 'Bing' except for 'Türkoglu', 'Tabaniyarık', 'Çavuş Ayşe', 'Hüsenba' and 'Karakirtik-1' (Table 3). The TSS of 'Ankarakirazi', 'Eraslama', 'Geçkiraz', 'Pasa', 'Karakirtik-1', 'Barama', 'Bella di Pistoia' and 'Arap' were higher than 'Bing' in 2001. 'Geçkiraz' had the highest acidity in 2000-2001. The fruit of 'Tabaniyarık' is very sweet even though it ripens early. It is also used in fruit juice industry. In 2001, the pH of 'Eraslama', 'Hüsenba' and 'Çavuşayşe' were higher than the others and the fruit juiciness of 'Arap' and 'Karakirtik-1' were higher than the others (Table 4). 'Eraslama', 'Pasa', 'Ankara Kirazi', 'Geçaslama' and 'Geçkiraz' grown in Merzifon are very sweet, but their shelf life is rather short except for 'Geçkiraz'. 'Geçkiraz' ripens in the first week of July and the harvest continues for approximately two weeks. Its fruit is very firm and suitable for transport. It also ripens in a season when the harvest of the other cherries is finished and it therefore can be sold for high prices. Besides, fruit stalk length and thickness, characteristics of stone, flower and leaf of all cultivars evaluated are presented in Table 4 and 5.

In conclusion, we have presented some characteristics of sweet cherries grown in the region which is the origin of the sweet cherry. Some of these unique gene resources may not be favorable to standard cultivars in terms of productivity and fruit quality but should be rescued from extinc-

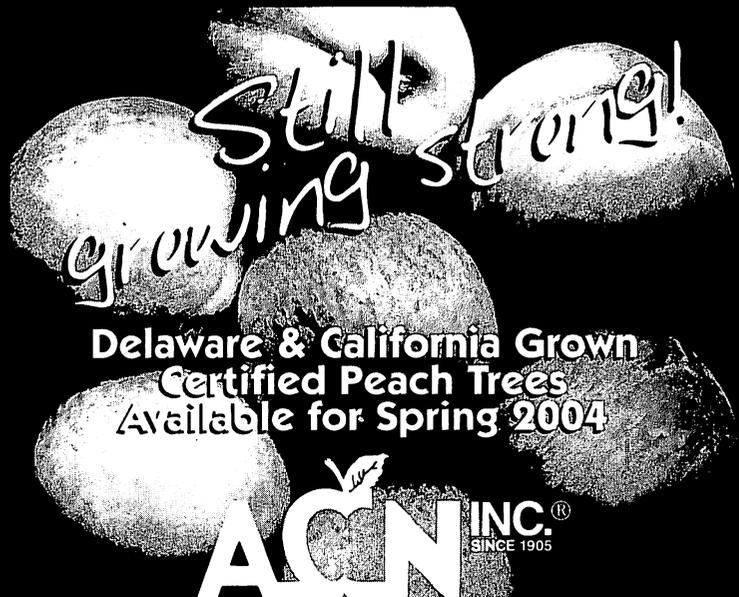
tion. In fact, these gene resources may be useful in sweet cherry breeding for high firmness and TSS, as well as early and late ripening.

Literature Cited

1. Anonymous, 1995. Cherry. Guidelines for the conduct of tests for distinctness, uniformity and stability. TG/35/6. International Union for the Protection of New Varieties of Plants.
2. Anonymous, 1992. Kiraz Çesit Katalogu. T.C. Tarım ve Köy İşleri Bakanlığı, Ankara.
3. Anonymous, 1996. Deciduous tree fruit cultivars. Fleming's Nurseries, Victoria, Australia.
4. Anonymous, 1997. Sweet Cherry. In The Brooks and Olmo Register of Fruit and Nut Varieties. Third edition ASHS Press. Alexandria, Virginia, 744p.
5. Anonymous, 1999. Tarımsal Yapı ve Üretim, DİE yayınları, Yayın No.2234, Ankara.
6. Anonymous, 2000. 1999 Çalışma Raporu. Tarım ve Köy İşleri Bakanlığı Amasya İl Müdürlüğü.
7. Anonymous, 2001. <http://apps.fao.org/lim500/nph-wrap.pl?Production.Crops.Primary&Domain=SUA&servlet=1>.
8. Baldini, E., 1973. Indagine sulle cultivar di ciliegio diffuse in Italia. (E. Baldini ed.) Ed. CNR.
9. Christensen, J. V., 1970. Cultivar trial with sweet cherries. Tidsskrift for Planteavl, 74:301-312.
10. Christensen, J. V., 1974. Numerical studies of qualitative and morphological characteristics of 41 sweet cherry cultivars II. Tidsskrift for Planteavl. 78:303-312.
11. Christensen, J. V., 1977. Evaluation and numerical studies of qualitative and morphological characteristics of 49 sweet cherry cultivars III. Tidsskrift for Planteavl. 81:148-158.
12. Christensen, J. V., 1984. Evaluation of qualitative characteristics of 48 sweet cherry cultivars IV. Tidsskrift for Planteavl, 88:277-285.
13. Christensen, J. V., 1985. Production of cherries in western Europe. Acta Hort. 169:15-26.
14. Christensen, J. V., 1999. An evaluation of sweet cherry cultivars. Dept. of Fruit Vegetable and Food Science. Denmark.
15. Davis, P.H., 1972. Flora of Turkey and Aegean Island. Volume 4. University Press, Edinburgh.
16. Demirsöy, L., 1997. The effects of preharvest chemical applications on fruit cracking and fruit characteristics of sweet cherry cultivars growing in Amasya. (Ph.D.thesis). OMU. Samsun, 161p.
17. Edizer, E. and B. Erdogan, 1999. Tokat'ta yetiştirilen bazı yerli kiraz çeşitlerinin fenolojik ve pomolojik özelliklerinin belirlenmesi.

- Türkiye III. Ulusal Bah.Bit.Kong., Ankara, 71-75.
18. Faust, M. and D. Suranyi, 1997. Origin and dissemination of cherry. (J. Janick, ed) Hort. Rev.19. John Wiley&Sons. Inc.
 19. Kappel F., 2002. Varieties Description. Cherry Breeding-Orchard Management. http://res2.agr.ca/parc-crapac/english/2summerland/horticulture/kappel/variety_descriptions.htm
 20. Kappel, F. and W.D. Lane, 1998. Recent sweet cherry introductions from the breeding program at Summerland, British Columbia, Canada. Acta Hort. 468:105-110.
 21. Kaska, N., 1998. Sweet cherry growing on Taurus mountains of Turkey. Acta Hort. 468:753-756.
 22. Kaska, N. and A. Küden, 1995. Kiraz Çesit ve seleksiyon çalışmaları. Türkiye II. Ulusal Bah.Bit.Kong. Adana, 233-237.
 23. Lang, G., D. Ophardt and J. Olmstead, 1997. Sweet cherry breeding. Washington State University. Acta Hort. 468:97-104.
 24. Nyeki, J., T. Szabo, A. Szabo, A. Andrasfalvy, M. Soltesz and G.K. Molnar, 1998. Morphological and phenological properties of sour cherry varieties grown in Hungary and their inter-incompatibility relations. Acta Hort. 468:595-602.
 25. Özçagiran, R., 1966. Kemal Pasa'nin önemli kiraz çeşitleri üzerinde pomolojik ve biyolojik araştırmalar. E.U.Z.F. Yayinlari No.115. 116p.
 26. Rusterholz, P., T. Schwizer and M. Kellerhals, 1998. New promising sweet cherry cultivars in Switzerland. Acta Hort. 468:123-129.
 27. Schmidt, H., J.V. Christensen, R. Watkins and R.A. Smith, 1985. Cherry descriptors. AGPG: IBPGR/85/37. IBPGR Secretariat, Rome.
 28. Vestreheim, S., 1998. Flowering in cherries as affected by pre-bloom temperatures. Acta Hort. 468:551-555.
 29. Wustenberghs, H., 1998. Screening of sweet cherry cultivars in Flanders 1988-1996. Acta Hort. 468:131-134.





Still strong!
growing

Delaware & California Grown
Certified Peach Trees
Available for Spring 2004



ACN INC.®
SINCE 1905

Adams County Nursery, Inc. • Aspers, PA
(800) 377-3106 • (717) 677-4124 Fax
www.acnursery.com • Email acn@cvn.net