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Agrobiologocal and Technological Characteristics of Table Grape Cultivar Danlas White

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SUMMARY

Viticulture has always been primarity directed towards growing wine cultivars white table grape cultivar growing was limited to very few highly valued cultivars which found their position in the big market.

A bigger interest has been shown in growing table grapes in Croatia in the latest 30 years through the existence of PK "Zadar" in the Zadar area. In this period 32 tables grape cultivars were introduced with objective to enrich the cultivars of the subregion of Northern Dalmatia. The latest introduction in 1985 included six new French cultivars among which there is Danlas white cultivar.

The results of five-year follow-up and three year research gave a detailed insight into basic agrobiological and economic and technological characteristics of this cultivar in the agrotehnical and ecological surroundings of the Ravni Kotari area.

According to the research results we can find out, that it is very valuable table grapes cultivar which has shown a very positive ratio of quantity and quality of grapes yield.

KEY WORDS

introduction, Danlas white cultivar, agrobiological characteristics, agrotechnique

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Agrobiološka i tehnološka svojstva stolne sorte grožđa Danlas White (*Vitis vinifera* L.)

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SAŽETAK

Uzgoj vinove loze oduvijek je bio usmjeren prvenstveno na uzgoj vinskih sorti, dok se uzgoj stolnih sorti ograničavao na vrlo mali broj vrijednih sorti koje bi našle svoje mjesto na velikom tržištu.

Kod nas se tek posljednjih 30 godina počela posvećivati veća pažnja uzgoju stolnog grožđa i to postojanjem PK Zadar na području Zadarske regije. U tom razdoblju introducirane su 32 stolne sorte sa ciljem obogaćivanja sortimenta podrajona Sjeverna Dalmacija. Zadnja introdukcija 1985. godina uključila je ispitivanje šest novih francuskih sorti među kojima se nalazi i sorta Danlas bijeli.

Rezultati petogodišnjih praćenja i trogodišnja ispitivanja dala su detaljan uvid u osnovna agrobiološka svojstva i gospodarsko-tehnološke karakteristike ove sorte u ambijentalno-agrotehničkim uvjetima Ravnih Kotara.

Prema rezultatima istraživanja može se zaključiti da se radi o vrlo vrijednoj stolnoj sorti koja je pokazala vrlo pozitivan odnos sinteze količine i kvalitete uroda grožđa.

KLJUČNE RIJEČI

introdukcija, sorta Danlas bijeli, agrobiološka svojstva, agrotehnika

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INTRODUCTION

On the Vassal estate of the French National Institute of Agricultural Research (I.N.R.A.) in The Grapevine Research Station - Montpellier in 1958. the Danlas white cultivar was obtained as the result of cross-breeding between Dabouki (Malaga white) and Chasselas white (Plemenka white) under the number 1548-20 EM.

It was recommended for production in 1981. with the clon no. 499. The authors are Professor J.Branas and P.Truel; B.Sc.

Through the above mentioned French Institute and by intermediary of The Department of Viticulture of the Faculty of Agriculture of Zagreb Univesity, Danlas white planting material was obtained. This material was grafted on The Rupestris du Lot stock and grafted plants were planted at P.K. "Zadar" - the "Ba{tica" lot.

THE LOT AND RESEARCH CONDITIONS

Vineyard

Researches were carried out the experimental vineyard of P.K. Zadar - the Ba{tica lot. It is located in an elliptic shaped valley positioned towards the west and the south, geographic position of the lot is 44°20' northern latiude and 15° eastern longitude, 125 m altitude. The Danlas white cultivar was planted on the section 24 on the Rupestris Lot stock. The training system is cordon "Casenove". The spacing is 2,80 x 1,20 m. The intensity of agrotehnical measure is complete.

Ecological Conditions

Climatical contidions

The climate in the Ravni Kotari region is Mediterranean with characteristics of the continental climate. Consequently the experimental plantation is of the same kind. This region is characterised by moderatey dry and hot summer months and rainy, moderately warm autumn and winter months.

In the researched period the medium annual air temperature was 13,4° and 18.6° in the vegetation period (1st April-30th September)

The average amount of solar hours was over 2,500.

The average annual precipitation was about 1,00 mm while during the vegetation period it was average 350 mm. The driest months are June and July and the highest precipitation is during the last three months of the year. The conclusion wich follows is that irrigation is needed for extensive production of table grapes.

Geological and soil conditions

The Ba{tica lot is situated in a cove in the synclinal area with its base formed of Eoecene marevsoil, mostly covered by different quarter sediments. The soil is carbonated. According to its texture it is a sort of argillaceous clay and argillaceous clayey sandy soil. The total porosity is medium with a higher water capacity and lower air capacity. According to its chemical composition these soils are neutral to poorly alcale reaction. T h e content of physiological active carbonates is between 10-12%. The soils show deficits in nitogen, potassium and phosphours so that is necessary to enrich it with adequate quantities of organic and mineral fertilizers.

MATERIALS AND METHODS

Researches and observations of the Danlas white cultivar were carried out in the course of 1987, 1988 and 1990. 17 vines set up according to the method of incidental order. Each vine was observed and measured separately so that one represented a specific experimental unit.

In order to enlighten major agrotehnical characteristics of this cultivar in determined environmental, agrotehnical and ecological conditions as well as th appropriate pruning system at the equal number of buds we set up the experiment on both spur pruning and cane pruning.

Amphelographic researches were carried out according to the International Ampeheolographic Commission methodology (O.I.V.) and The International Board for Plant Genetic Resources (I.B.P.R.G.).

Botanical description of the cultivar was made according to Lazarevski supplemented according to Galet.

Philometric measurments were carried out every year on 10 leaves wich were taken at the end of August from 9 to 12 nods of fertile shoot. All measurable elements were marked (Table no. 1) and the surface of the leaf was measured by planimetre.

Out of agrobiological research phenological observations were made as well as bud fertility research according to the modified methodology of the horizontal and vertical projection of the bud position on a bearing wood. The results of the research were processed statistically so that the significance grade of the samples was carried out by "t" test.

Technological exminations were done on 10 bunches every year according to Prostoserdov' s mechanical analysis. Their mass approximately corresponded to the average mass of a grape bunch; 100 berries and 100 seeds.

The chemical analysis of "must" was made according to the standard method.

Sugar concentration was determined by Babo' s system, by neutralisation with n/4 NaOH.

All the gathered results were processed statistically in the Department of Viticulture of the Faculty of Agriculture.

RESULTS

Amphelographic description of the Danlas white cultivar

Synonims: none

Origin and history: Obtained as the cross breed (1958) of Dabouki - (Malaga white) x Plemenka white (Chasselas dore) under member 1548-20 EM. Selected on the Vassal plot and recommended for cultivcation in 1981 originating from the clone no. 499. Introduced in PK "Zadar" in 1985.

Botanical description

The tips of shoots: bright, bronze-redish as with Plemenka

Young leaves: bright, slightly bronzed, face and its back hairless, petiole red.

Mature leaf: clearly divided in five lobs with very marked sinuses. The leaf is bare with red veins. Teeth large and blunt. The petiole sinus in the from of the lira. The petiole is clearly red. According to the length (L=19.77) of Danlas white it is categorised in the group of cultivars with medium size leaf (table no. 1) while the ratio between its length and width indicates that its shape is heart -like or round (L/I-1,03).

According to the Pulliet classification, on the basis the ratio of the length of the main nerve (A) and the petiole length (p) this leaf is classified in the group of very long leaves (index A/p=1,13).

According to the index of the depth of lateral sinuses it is classified in the groups of cultivars with very deep lateral sinuses (index B/ab=3,09) or index $B'/a'b'=3,05$) and with deep lower lateral sinus (index C(bc=2,15) or $C'/b'c'=2,32$). The leaf surface (P) varied within the limits of 174,4 to 322,5 cm^2 and medium value was 233,33 cm^2.

Flower: hemafrodite.

Bunch: large (length 19-22,5), pyramid shaped, dispersed, weight 370-500 grams, nice outlook.

Berries: big (19,13 x 19,10 mm) large (4,5 g) unvariedly round (index 1,00) with a red peduncle. Yellowish amber colour, strong and resistant skin, flesh crispy with very pleasant flavour.

Seeds: medium large (4,90 g) average dimensions 6,54 x 3,74 mm, with medium lage hilum, chestnut brown colour, chalase well seen.

Cane: fat, red.

Agrobiological researches

Fenological observations

In order to learn better and to observe more realistically important agrobiological and economic and technological features of the examined cultivar, it is of outmost importance to observe particullar phenophases. Although some of these phenophases are genetical, they

Table 1. Statistical survey of philometric measurments

Sings of philometric elements	n	x	s	sx	min	max	x-zsx (95%)	x+zsx (95%)	V%
P cm^2	30	233.3	46.28	14.64	171.4	322.5	200.2	266.4	19.84
A	30	14.01	1.60	0.51	12.20	16.90	12.86	15.16	11.44
B	30	11.49	1.42	0.45	9.50	14.50	10.48	12.50	12.34
C	30	8.18	1.10	0.35	7.00	10.90	7.39	8.97	13.45
D	30	4.62	0.71	0.22	3.70	6.00	4.11	5.13	15.30
B'	30	11.70	1.31	0.41	9.70	13.50	10.77	12.63	11.16
C'	30	8.32	0.63	0.20	7.00	9.20	7.87	8.77	7.56
D'	30	4.62	0.33	0.10	4.00	5.10	4.38	4.86	7.17
ab	30	3.83	0.62	0.20	2.50	4.60	3.39	4.27	16.22
bc	30	3.75	0.52	0.16	3.10	5.00	3.38	4.12	13.77
a'b'	30	3.87	0.33	0.10	3.40	4.50	3.64	4.10	8.42
b'c'	30	3.68	0.50	0.16	2.90	4.50	3.32	4.04	13.52
L	30	19.77	1.57	0.49	17.40	22.00	18.65	20.89	7.92
l	30	19.29	2.17	0.69	15.50	22.30	17.74	20.8 4	11.25
p	30	12.37	1.87	0.59	9.00	14.30	11.03	13.71	15.15
B/ab	30	3.09	0.57	0.18	2.20	4.08	2.68	3.49	18.38
B'/a'b'	30	3.05	0.39	0.12	2.39	3.47	2.77	3.33	12.89
C/bc	30	2.15	0.34	0.11	1.71	2.74	1.90	2.39	15.91
C'/b'c'	30	2.32	0.43	0.13	1.62	2.98	2.01	2.62	18.35
L/1	30	1.03	0.06	0.02	0.93	1.16	0.98	1.07	5.88
α	30	63.50	6.47	2.05	53.00	74.00	58.87	68.13	10.19
ß	30	63.30	5.46	1.73	55.00	75.00	59.39	67.21	8.63
γ	30	62.10	3.01	0.95	58.00	68.00	59.94	64.26	4.86
α'	30	63.90	5.91	1.87	52.00	75.00	59.67	68.13	9.24
ß'	30	64.00	6.36	2.01	55.00	78.00	59.45	68.55	9.93
γ'	30	65.50	5.54	1.75	55.00	75.00	61.54	69.46	8.45
d	30	1.91	0.47	0.15	1.20	2.7 0	1.58	2.24	24.38
h	30	1.60	0.55	0.17	0.90	2. 50	1.21	1.69	34.12
x	30	4.75	0.49	0.16	4.20	5.90	4.40	5.10	10.41

Table 2. Description of characteristics of the cultivar Danlas white

		1.5.4.	Evaluation
YOUNG SHOOT	- form of tip	4.1.1.	5
	- intensity anthocyonin	4.1.2.	5
	- dansity of erect hairs of tip	6.1.2.	5
SHOOT	- attitude	6.1.3.	3
	- color of dorsal side of internodes	6.1.4.	3
	- color of ventral side of internodes	6.1.5.	3
	- anthocyan coloration of buds	6.1.11.	5
TENDRILS	- length	6.1.12.	5
	- distribution on the shoot	4.1.5.	1
MATURE LEAF	- size	4.1.6.	
	- number of lobes	4.1.7.	3
	- general shape of petiole sinus	4.1.9.	9
	- length	6.1.19.	5
	- anthocyan coloration of the main veins on the upper side of the blade	6.1.22.	9
	- gaffering blade	6.1.24.	1
	- density of prostrate leaf between the veins (lower side)	4.1.10.	1
	- denstiy of errect hairs between the sides (lower side)	4.1.11.	2
	- shape of blade	6.1.20.	1
	- particularites of petiole sinus	6.1.31.	3
	- shape of upper leaf sinuses	6.1.32.	
INFLORESCENCE	- insertion of 1st inforescence	6.2.1.	2
	- sex of flower	4.2.1.	3
BUNCH	- size	4.2.2.	7
	- number of bunche per shoot	6.2.4.	2
	- density	6.2.6.	3
	- number of berries	6.2.7.	3
BERRY	- size	4.2.4.	9
	- shape	4.2.5.	3
	- length	6.2.9.	5
	- uniformity of size	6.2.10.	2
	- intensity of the color of flesh	4.2.7.	1
	- color of skin	4.2.6.	1
	- uniformity of the color of skin	6.2.12.	2
	- cross section	6.2.11.	2
	- firmness of flesh	6.2.17.	7
	- presence of seeds	4.3.1.	3
	- weight of seeds	6.3.3.	5

usually vary under the determined influence of exteriour factors - primarily climatic ones.

On the basis of such researches we have come to the following data:

Observations carried out through the years of research have pointed out the Danlas white cultivar according to our growing conditions and the ripening stage is an early cultivar. It means that it comes in the course of the high tourist season when there is no other table sort available in the market. Resuming these details it can be concluded that the bud burst stage colouring stage and ripening stage occurred with spur pruning variant earlier than with cane pruning variant respectively.

Fertility

One of the most imporant agrobiological characteristics of the cultivar which does not depend on its biological features but on a number of other factors is certainly its fertility. By determining basic fertility elements of the cultivar with the application of different pruning systems we are able to mark its economic value especially the possibility of safe application in production under determined ecological conditions.

Table 3. Vegetation cycle of development

Phenophases	1987		1988		1989		1990	
	spur pruning	cane pruning	spur pruning	cane pruning	spur pruning	cane pruning	spur pruning	cane pruning
Tearing stage	20.3.	20.3.	23.3.	23.3.	20.3.	20.3.	26.2.	26.2.
Bud burst	30.3.	2.4.	31.3.	3.4.	30.3.	3.4.	23.3.	26.3.
Flowering stage	26.5.	26.5.	29.5.	29.5.	24.5.	24.5.	24.5.	24.5.
Colouring stage	20.7.	24.7.	28.7.	1.8.	24.7.	27.7.	25.7.	26.7.
Ripening stage	23.8.	25.8.	25.8.	29.8.	26.8.	30.8.	16.8.	20.8.

Table 4. The fertility and position of buds on spurs - spur pruning average 1988-1990

Bud fertility		pruning		TotalNo. of buds
	1	2	3	
0	6	1	%	7
rn	20	19	1	40
rr	47	46	9	102
rr2	23	24	11	58
rr3				
TotalNo. of buds	96	90	21	207
Percentage				
0	62	1.1	%	3.4
0+rn	27.1	2.2	4.8	22.7
rr+rr2	72.9	77.8	95.2	77.3

Legend: 0-bud aborted, rn-bud developed into an infertile shoot, rr-bud developed into a fertile shoot (1 bunch)
rr2 anb rr3 bud developed into a fertile shoot (2 to 3 bunches)

Bud fertility according to its position on a bearing wood

In order to learn better the fertility of buds according to their position on a bearing wood, we specifically registered all the buds every year. Despite the different climatic and other factors wich conditioned certain variations in some indications a truthful image of the characteristics of the examined sort was obtained. It refers particularly to formation, differentiation and development of buds.

In tables 4 and 5 numerical frequency and percentage of buds according to their categories related to their position in "canes" and spurs in shown.

Analysing these results it was possible to determine that form an average number of 202 examined buds (marked with "0") on a fertile wood of cane pruning there were 11 aborted buds (5,4%) "canes" there were only 4,2% and on spurs 11,8% aborted buds while with spur pruning from 207 examined buds there were 7 aborted ones wich is 3,4%.

The biggest percentage of aborted buds on both pruning systems was on the first bud 13,3% (cane pruning) and 62% (spur pruning) and it almost regularly decreased along the length of bearing wood.

There were 11 buds wich developed into infertile shoot (marked "rn) wich is 5,5% (on canes 4,7% and on spurs 8,8%) with cane pruning while with spur pruning they were 40 wich is 19,3% respectively. If we add the aborted buds those buds which developed into infertile shoot, we get the results which tells us that as far as grapes production is concerend 10,9% of this production was lost with cane pruning and 22,7% with spur pruning. There were 180 or 89,1% fertile buds (marked "rn") which developed into a shoot with one, two or three bunches on "canes" 91,1% and on spurs 79,4% with a cane pruning and 160 or 77,3% with a spur pruning.

All the buds showed fertility exceeding 50% but all the same we have to stress that the buds fertility was bigger on canes. With cane pruning (higher no. of buds) the vine manifested in every examined year regular and high yield which shows that its constant fertility is the dominant biological characteristic of this cultivar.

Studying the data in tables 6, 7 and 8 the following could be concluded:

- Number of fertile buds per wood was practically the same - 11,9 which is 3,5 buds per m2 with cane pruning and 12,2 or 3,6 per m2 with spur pruning.
- Medium values of a shoot per bud with both variants were 0,9.
- Medium values of bunch numbers per vine with cane pruning was 19,7 and with spur pruning 9,3. In all years of the research period a bigger number of bunches was obtained per vine with the application of cane pruning system. The differences were significant in all three years at the level of 5% and 1%.
- Medium weight of one bunch with cane pruning was 462 grams and with spur pruning 371 grams. Both of these values are considered favourable for a table cultivar, although because of exceptionally high variability per particular vine there is no statistical justification of the difference in the weights of bunches. Even in 1989 the weight of bunches was higher with spur pruning than with cane pruning. Still it was indicated that bunches were nicer in apperance (size, uniformity and berry ripeness) with cane pruning.
- Both fertility coeffcients - potential and effective were with cane pruning insignificantly different (1,3-1,2) which indicates that from the inflorescnce period until harvest period there were neither bigger flower not bunches losses as the eventual consequence of bad fertilisation, dissipation or fungus diseases. With spur pruning differences were more indicated 1,0 - 1,7.
- Medium value of grapes yield per vine in the researched period was 6,3 kg and 1,8 t per hectare respectively with cane pruning and 3,4 kg per vine with spur pruning - or 10 tn per hectare. Statistically processed data showed that in all three years yields per vine were different and the level of 5% and 1% security in favour of cane pruning.

Table 5. The fertility and position of buds on "canes" and spurs - cane pruning - average 1988-1990

Bud fertility	Position of bud on bearingwood												No of buds	Pruning			No of buds	Tital No. of buds
	1	2	3	4	5	6	7	8	9	10	11	12		1	2	3		
0	2	1	1	1	1		1						7	2	2		4	11
rn	1	2	1	1	1	1	1						8	1	1	1	3	11
rr	8	8	8	7	7	7	7	7	9	7	5	3	83	8	8	1	17	100
rr2	3	3	5	6	5	6	6	7	5	6	5	4	61	4	4	2	10	71
rr3	1	1			1	1		1	1	1	2		9					9
TotalNo. of buds	15	15	15	15	15	15	15	15	15	14	12	7	168	15	15	4	34	202
Percentage																		
0	13.3	6.7	6.7	6.7	6.7		6.7						4.2	13.3	13.3		11.8	5.4
0+rn	20.0	20.0	13.3	13.3	13.3	6.7	13.3						8.9	20.0	20.0	25.0	20.6	10.9
rr+rr2	80.0	80.0	86.7	86.7	86.7	93.3	86.7	100	100	100	100	100	91.1	80.0	80.0	75.0	79.4	89.1

Legend: 0-bud aborted, rn-bud developed into an infertile shoot, rr-bud developed into a fertile shoot (1 bunch), rr2 anb rr3 bud developed into a fertile shoot (2 to 3 bunches)

Table 6. The Results of research on inflorescense elements - cane pruning - average 1988-1990

Year	Buds			Shoots			Inflorescence	Bunches				1	Coefficinet of fertility		Grapes yield		
	Total	per vine	per m^2	Total	Fertility	per bud	Total	Total	per vine	per shoot	per fertile shoot	bunch	potential	effective	per vine	per m^2	per ha
1988	169	9,9	2,9	168	150	0,99	277	220	12,9	1,3	1,4	51,4	1,6	1,3	6,6	2,0	20
1989	173	10,2	3,0	170	165	0,98	311	287	16,9	1,6	1,7	30,0	1,7	1,6	5,1	1,5	25
1990	263	15,5	4,6	234	225	0,88	219	193	11,4	0,8	0,8	57,4	0,8	0,7	6,5	1,9	19
1988-1990	202	11,9	3,5	191	180	0,95	269	233	13,7	1,2	1,3	46,2	1,3	1,2	6,3	1,8	18

Table 7. Results of the research on fertility elements - spur pruning - average 1988-1990

	Buds			Shoots			Inflorescence	Bunches				1	Coefficinet of fertility		Grapes yield		
	Total	per vine	per m^2	Total	Fertility	per bud	Total	Total	per vine	per shoot	per fertile shoot	bunch	potential	effective	per vine	per m^2	per ha
	170	10.0	2.9	175	141	1.0	202	146	8.5	0.8	1.0	42.2	1.2	0.8	3.6	1.06	
	181	10.6	3.1	205	164	1.1	222	150	8.8	0.7	0.9	32.9	1.2	0.8	2.9	0.85	
	271	15.9	4.7	220	175	0.8	231	178	10.5	0.8	1.0	36.2	0.8	0.6	3.8	1.11	
990	207	12.2	3.6	200	160	0.9	218	158	9.3	0.8	1.0	37.1	1.0	0.7	3.4	1.01	

Table 8. Average number of bunches, mass of bunches and avarage yield (kg/vine) of c.v. Danlas white (1988-1990)

Year	1988.		1989.		1990.	
	spur pruning	cane pruning	spur pruning	cane pruning	spur pruning	cane pruning
Number of bunches	12,94**	8,59	16,88**	8,06	11,35**	10,53
Avarage mass of bunches (g)	537,96	334,34	336,72	397,29	592,02	370,03
Yield (kg/vine)	6,70**	2,82	5,06**	2,90	6,52**	3,79

Table 9. Mechanical composition - 1988-1990

POSITION OF A BUNCH AND BERRIES	CANE PRUNING	SPUR PRUNING
Average weight of bunch - grams	462	371
Average weight of berries in bunch - grams	450	359
Average number of berries in a bunch - pieces	101	96.60
Average weight of 100 berries - grams	445.5	372.09
Average weight of peduncle - grams	12.0	11.68
Average weight of skin in a bunch - grams	18.5	23.55
Average weight of skin in 100 berries - grams	18.3	24.38
Average weight of flesh in a bunch - grams	426.5	328.47
Average weight of flesh in 100 berries - grams	422.3	340.03
Average weight of seeds in a bunch - grams	5.0	7.42
Average weight of seeds in 100 berries - grams	4.9	3.24
Average number of seeds in a bunch - pieces	287	228.9
BUNCH STRUCTURE		
Penduncle in a bunch %	2.60	3.15
Skin %	4.00	6.35
Seeds %	1.08	2.00
Flesh %	92.32	88.51
Solid residue %	7.68	11.49
Skeleton %	6.60	9.49
Structure index %	13.98	9.32
MEHANICAL FEATURES OF BERRIES		
Reaction firmness grams	950-1600	900-1550
Resistance to picking gr.	450-650	425-600

Table 10. Statistical survey of uvometric research - cane pruning

	n	x	s	Sx	min	max.	x-zSx (95%)	x+zSx (95%)	V (%)
Length of a bunch in cm	30	20.91	1.11	0.35	19.00	22.50	20.19	21.63	5.33
Width of a bunch in cm	30	13.97	0.897	0.28	12.50	15.30	13.40	14.54	6.34
Weight of a bunch in g	30	462.20	62.57	19.79	369.00	574.00	421.84	502.56	13.54
Weight of berries g	30	451.97	63.92	20.21	362.00	576.00	410.74	493.20	14.14
Number of berries	30	84.00	13.24	4.19	62.00	113.00	75.46	92.54	15.76
Length of a berry in mm	300	19.13	1.30	0.13	16.00	22.20	19.39	18.86	6.78
Width of a verry in mm	300	19.10	1.19	0.12	15.60	22.0	19.34	18.85	6.25
Index of a berry	300	1.00	0.04	0.00	0.92	1.11	1.01	0.99	3.76
Length of a seed	300	6.54	0.31	0.03	5.50	7.10	6.60	6.48	4.70
Width of a seed	300	3.74	0.29	0.03	3.10	4.40	3.80	3.68	7.83
Index of a seed	300	1.76	0.15	0.02	1.43	2.06	1.79	1.73	8.72

Table 11. Statistical survey of uvometric research - spur pruning

	n	x	s	Sx	min	max.	x-zSx (95%)	x+zSx (95%)	V (%)
Length of a bunch in cm	30	18.92	2.63	0.83	14.90	22.80	17.06	20.78	13.92
Width of a bunch in cm	30	11.89	2.12	0.67	7.60	14.60	10.39	13.39	17.87
Weight of a bunch in g	30	371.20	105.35	33.31	228.60	542.65	296.97	445.42	28.38
Weight of berries g	30	359.52	102.61	32.45	220.52	527.62	287.22	431.82	28.54
Number of berries	30	96.60	30.31	9.58	55.00	138.00	75.25	117.95	31.37
Length of a berry in mm	300	17.93	1.60	0.16	12.56	20.81	17.60	18.26	8.93
Width of a verry in mm	300	17.92	1.84	0.18	13.14	21.96	17.55	18.30	10.26
Index of a berry	300	1.00	0.07	0.01	0.86	1.18	0.99	1.02	6.97
Length of a seed	300	7.11	0.40	0.04	6.19	7.87	7.03	7.19	5.68
Width of a seed	300	3.84	0.33	0.03	2.94	4.65	3.77	3.91	8.55
Index of a seed	300	1.86	0.15	0.01	1.42	2.20	1.83	1.89	7.84

Table 12. Chemical analysis of must

	1988		1989		1990		Average 1988-1990	
	spur pruning	cane pruning	spur pruning	cane pruning	spur pruning	cane pruning	spur pruning	cane pruning
pecific weihgt 17,5°C	1.060		1.060		1.060		1.063	1.060
Sugar by Babo %	12.1	13	12.0	13.5	14.0	14.5	12.7	13.7
Total acids (wine acid)	4.6	5.2	4.8	5.3	5.5	5.8	5.0	5.4
Ripening	0.38	0.40	0.40	4.4	0.39	0.40	0.39	0.4

Technological characteristics

Mechanical composition

From the results of mechanical examination of bunch and berry composition (Table 9) its is most significant to indicate that 92,32% of the bunch is its flesh (cane pruning) or 88,5% respectively (spur pruning) while firm residue (peduncle, skin and seeds) is only 7,68% with pruning or 11,49% with spur pruning, which we consider to be more than a satisfactory ratio.

High values of reaction firmness and medium high resistance of berries to picking were indicated with both cane and spur prunings. This is considered to be a positive characteristics as well as a precondition of good transportabiliy and capacity to be stocked in refrigerated warehouses.

In commercial experiments it was proved that this sort confirmed its transportabillity especially with cane pruning whereas browing of pedicel was hardly 10% in the period of one month (25.8.-25.9.).

In the course of research uvometric values were determined and the results are shown in the table 10 and 11.

Chemical analysis of must

Practical experience

It is a very vigor cultivar. Prefers higher training systems and higher loading of vine with fertile buds Grapes are well preserved on the vine even after the period of ripening i.e. until the end od September. The bunch has a lovely appearance with expressive amber colour of berries. It is not necessary to treat a bunch (trimming), It is easily transported. It is evaluated as the sort of high economic value.

CONCLUSION

In the course between 1987-1990 agrobiological philometric and technological researches of the Danlas white cultivar were carried otu at PK "Zadar" - Ba{tica lot. The researches were done according to the methodology applied by International Amphelographic Commission (OIV), International Board for Genetic Resources (IBPRG) as well as using statistical "T" test.

On the basis of the ashived research the following conclusions have been reached.

1. Under the given agrotehnical conditions the Danlas white cultivar can be ranged within the cultivars ripening in the first period.
2. Parallel agribiological and the technological features with cane pruning and spur pruning were researched.
3. There were 202 buds examined with cane pruning out of which 5,4% were aborted, 5,5% were barren and 77,3% were fertile ones. The above mentioned data show that the cane pruning variant showed high crop potential.
4. Observing the fertility of the researched elements the following details can be indicated:

* The number of fertile buds per vine was practically the same with both variants, on average 11,9 which is 3,5 buds per 1m2 with cane pruning and 3,6 buds per 1m2 with spur pruning.
* Medium values of the number of bunches per vine were 13,7 with cane pruning and 9,3 with spur pruning.
* In all of the observed years a higher number of bunches was obtained with cane pruning and the differences were significant in every year at the level of 5%.
* Medium weight of a bunch was 46,2 dag with cane pruning and 37,1 dag with spur pruning, which can be considered favourable for a table cultivar. However it was shown that a bunch with cane pruning shapewise is of better quality and more acceptable as far as its market value is concerend owing to uniformity of berries, their colour and ripeness.
* Fertility coeficients were insignificantly different (1,3-1,2) with both variants.
* Medium values of grapes yields per vine were a cane pruning 6,3 kg or 18 tons/ha while they were 3,4 kg or 10 tons/ha with spur pruning. In all three years statistics at the level of 5% and 1% significance speak in favour of cane pruning.
* The results of mechanical composure and features of a bunch and berries indicate that cane pruning variant has higher values for majority characteristics.
* The value of reactive firmness was higer with cane pruning variant (950-1600 : 900-1550).
* The sugar content according to Babo was higher with the cane pruning variant (13,7% : 12,7%).
* Danlas white cultivar featured itself as a very interesting table cultivar of early ripening and as such one it can replace the sort Queen of vineyards owing to better characteristics. It endures transporation well.

Generally it can be estimated that Danlas white is the cultivar of high economic value.

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