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The Role Of Crossbreeding and Hybrids in Selection Work

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Abstract: The use of population-created populations using analytical selection is of great benefit to selection. These varieties, in many respects, surpass the original material from which they originated. However, in the selection varieties created as a result of selection of natural populations, some features of the original material are preserved. In most of them, features such as high productivity and disease resistance are low.

Keywords: Mulberry tree selection, population, hybrid, worm feeding, mulberry leaf, coefficient, mulberry tree, seedlings, cultivar, fodder, agrotechnics, special feeding mulberry.

Introduction.

Due to this, the demand for selection varieties has led to the use of the method of hybridization in selection work. With the role of synthetic selection it is possible to create the characteristics of two or more parent trees in a single hybrid organism.

Hybridization allows for a wider use of selection methods. Breeders created such forms of plants that it took a long time for these forms to be created under natural conditions or it was impossible to create them completely. VI Michurin said that hybridization is the most powerful method of selection.

If interbreeding is carried out between varieties belonging to the same species, it is called intra-species hybridization. When hybridization is done between different species or generations, it is called long-distance hybridization (these can be interspecific).

Hybridization can be artificial or natural. Natural hybridization is common in nature. This hybridization can occur not only between varieties and species, but also between plants with different species and generations. It is therefore necessary to select paternal maternal trees in advance to enhance the heterozygous feature of first-generation hybrids. They must be adapted to fertile natural conditions.

The survival process of the silkworm depends on the amount of water, minerals and

organic matter in the leaves of this or that variety it consumes.

Therefore, in the evaluation of this or that variety, it is advisable to combine the chemical analysis of the leaves with the feeding of worms.

The method of chemical analysis helps to determine the relationship between the amount of nutrients in the leaf and the effect of basic agroecological conditions.

The chemical composition of the leaf, along with its yield, is one of the key indicators in varietal testing. Finally, by studying the chemical composition of the leaf and knowing that the dynamics of its main parameters change under the influence of certain agrotechnical measures, we can achieve an improvement in leaf quality in the desired direction.

Prepare a sample to determine the chemical composition of the leaf. The chemical composition of the leaf varies not only depending on the type of mulberry, the level of care, methods of use of the worm, and other conditions, but also on the location of the leaf on the branches of each tree and the age of the mulberry.

In order for the sample leaves to be average, the leaves are plucked from the lower, middle and upper parts of the twigs located on the north, south, east and west sides, separately from the shrubs and tall mulberry trees growing in different places. The mass of the sample should be around 1-3 kg, depending on the size of the mulberry field. To determine the initial moisture in the leaf, 50 g of freshly prepared leaf is weighed twice and all remaining chemical elements are dried and determined from the interpreted sample.

The various sugars in a freshly prepared leaf are altered by various enzymes during the decomposition process under the influence of water. To prevent this from happening, the enzymes in the new sample leaves are killed using water vapor. To do this, pour water into the bottom of the pot on the tank or floor. It is placed in a glazed pot a little above the water level and 3-4 layers of leaves are collected on it, close the lid and boil for 15-20 minutes. During this time, the leaves are mixed using a glass rod.

The leaves are then removed and spread out in a single layer on a cloth in the open, but in the shade, on the ground, and rolled with a glass rod until dry. The composition of the sample leaf of this variety is preserved unchanged for a long time.

The well-dried leaf is interpreted in the laboratory, then the eyes are passed through a sieve the size of 0.5 mm.

It is spread thinly on paper to dry thoroughly, and the paper is also laid on top of it, alternating from time to time for two nights - during the day. The well-dried leaves of talcum powder are then mixed and spread thinly on another sheet of paper, 200 g of the sample is taken in 5-6 portions to determine its chemical composition. It is placed in a glass jar with a tightly closed mouth.

If it is necessary to check the dynamics of substances in the leaf during growth, it is desirable to prepare samples after a certain period of time or depending on the age of the silkworm. To know how the nutrients change during the day and night, the leaves should be collected in the morning, afternoon and evening (before sunset).

A special journal is kept during the preparation of the sample, which contains the name of the field where the leaves were prepared, mulberry variety, mulberry type, time of preparation, day, month, year, air temperature and humidity, the last day of mulberry irrigation

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and agro-technical measures applied to mulberry.

Water in the leaves. The water in the leaves is important in regulating the metabolism that occurs in the mulberry tree and the silkworm that consumes it.

In particular, water plays an important role in the formation of protoplasms in the tissues of worms, the dissolution of minerals and organic matter in all parts of the body, respiration and regulation of body temperature.

The body of the silkworm is 80-85% water. Therefore, it is in great demand for leaf water. The amount of water in the leaves decreases during the growth of the mulberry, and its ripening increases, that is, its physical properties also change. For example, in the spring, when the newly grown leaves have a moisture content of 75-80%, after 20-25 days, with the ripening of the leaves, that is, at the fourth to fifth year of the worm, the humidity decreases to 68-70%.

The water content of the leaf decreases with its ripening, regardless of the mulberry variety (Table 1).

As can be seen from Table 1, in all varieties the moisture content in the leaf decreased by 2-4% at the fifth age compared to the first age of the worm. However, the level of moisture in the leaves also depends on the mulberry navigation. For example, the humidity is around 68-75% depending on the season in the summer, Lixi-5, seedless varieties of Tajikistan in the fifth age of the worm, and 66-71% in Khasak, Pioneer and October varieties.

The table shows that during the spring worm feeding, the leaves have a lot of moisture, and during the summer and especially the autumn worms have a relatively small amount. In summer, Lixi - 5 and Tajikistan seedless varieties had the required amount of water in the leaves, especially in the summer and autumn, for the fifth-year worms (68–70%). A similar result was obtained by N.M.Finaeva, who said that in the first age of the worm the water content in the leaves is 75-80%, in the third age 72-74% and in the fifth year 68-70% of the leaf content.

In worm-feeding seasons, the total moisture content of the varieties, depending on the degree of ripening of the leaf, in

Table 1

Varieties	Worm feeding seasons								
	Spring			Summer			Autumn		
	24 - 30/IV	30/IV -6/V	12 - 20/V	10 - 12/VII	20 - 21/VII	3 - 4/VII	28-31 /VIII	21 -29/IX	20 - 21/X
Summer	78,3	77,6	75,2	78,5	77,0	73,5	72,7	70,5	70,0
October	75,2	74,0	72,6	73,4	72,5	71,4	70,5	67,0	66,7
Lixi -5	76,9	76,0	73,7	75,7	74,4	73,1	71,2	69,9	68,6

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Pioneer	75,0	73,7	71,5	73,2	73,0	71,2	69,0	67,8	67,2
Tajikistan is seedless	77,6	77,0	74,6	77,5	75,5	72,5	73,8	71,1	70,5
Khasak	73,7	73,2	71,0	72,7	71,0	70,5	68,4	67,8	67,2

Special preparation of mulberries for each season also has a positive effect on the increase in the amount of water in the leaves. In particular, pre-pruning of twigs for summer and autumn worms increases the moisture in the leaf by 4-5%, which slows down the ripening of the leaf.

The amount of water in the leaves decreases in the evening. This figure also differs to some extent by varieties. For example, in the summer variety, the moisture in the leaves decreased more in the evening. This process is especially noticeable on summer leaves.

According to M. Asomova, when irrigated in rows Khasak mulberry, the moisture content of the leaves was 70% in the morning on May 21, and 64% when not irrigated. The hygroscopic water in the leaf, on the other hand, increases in the evening.

The change in the amount of water in the leaves during the day, in%

Table 2

Tracking Periods	Hours	Varieties			
		Lixi 2	SANIISH 6	SANIISH 14	Summer
Green leaves					
7-15/V	7-9	75,3	75,8	75,3	73,5
	19-20	72,7	72,9	73,8	70,8
21/V	7-9	74,7	75,4	76,0	71,8
	19-20	71,8	72,5	73,8	70,0
Summer leaves					
16/VI	7-9	74,6	72,2	76,2	75,0
	19-20	68,8	69,4	70,0	65,2
14/VII	7-9	75,0	79,2	75,5	78,9
	19-20	70,1	71,6	74,6	70,9
20/VII	7-9	73,9	74,8	74,9	74,4
	19-20	70,4	72,2	71,5	69,0

The moisture level of the leaf varies depending on the location on the rod. For example, the leaves at the end of the branch have the most moisture, while the ones in the middle and bottom have relatively less. The leaves at the bottom of the branch lose more water in themselves than at the top, i.e. the water evaporates.

Evaporation varies depending on the method of storage of the leaf from the time of daily preparation to the time it is fed to the worm.

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For example, according to M.N. Finieva, at the fifth age of the blue worm, the moisture content of freshly harvested leaves of Tajik seedless and Hasaki mulberries was 74 and 72%, while the open content in the wormhole decreased by 22 and 25% or 57 and 51%, respectively. . When the cloth soaked over the leaves was kept covered, the evaporation of water after 6 hours was only 0.9–1.0% or 73.3 and 71.2% of the total humidity.

The ash in the leaves and the mineral elements in it. In addition to water, the leaves contain a certain amount of minerals (ash) and organic matter. Minerals include calcium, phosphorus, potassium, sulfur, sodium, chlorine, magnesium, iron, fluorine and other substances. They play a major role in the structure of tissue protoplasms, in the vital activity of tissues, in the presence of moderate (neutral) acidity (RN) of leaf sap, and in the silkworm production of worms.

The ash content in the leaves increases during the growth of the mulberry. When mulberry growing conditions are at the same level, the amount of ash in the leaf and the maturity of the leaf will vary depending on the mulberry navigation. For example, according to N.M.Finaeva and M.Gurdaeva, during the spring, summer and autumn feeding seasons, the ash content in the leaves was relatively small, and the remaining organic matter was more. At the same time, in all varieties from spring to autumn increased ash content. In particular, in Tajikistan seedless and Khasak mulberry 26 / IV, 3 / V, 16 / V, 11 / VII, 21 / VII, 2 / VIII, 29 / VIII, 28 / IX and 21 / X "raw" ash - 8 , 50-8.52; 10.2-10.7; 11.4-14.4; 12.2-12.9; 13.9-15.0; 15.6-16.7; 17.5-18.2; 19.6-21.1 and 20.7-22.4%, respectively.

The importance of macro and micro elements in leaf composition was described above. Phosphoric acid is involved in activating the metabolism of sugars, fats, amino acids and others. Among the varieties tested above, it was shown that the leaves of Tajik seedless mulberry contained the most (0.29%) phosphorus.

Potassium improves the nutritional value of the leaf. Potassium, phosphorus and calcium are involved together in improving leaf quality. However, when there is a certain relationship (0.55-0.7 and 6.9-8.5) between potassium and calcium and calcium and phosphorus, leaf quality improves.

According to N.M. Finaeva, the amount of potassium and phosphorus in green leaves is higher than in summer leaves.

According to Japanese scientists, the use of nitrogen fertilizers for industrially fed worms, mulberry leaves fed with phosphorus fertilizers for breeding cocoons gives good results.

Depending on the amount of calcium in the leaf, its degree of ripeness or hardness is determined. As the degree of hardening of the leaf increases, it becomes difficult for worms to eat and digest it.

The hardness coefficient of the leaf increases from spring to autumn and increases with the age of the worm during each feeding season. This figure varies depending on the pre-cut mulberry twigs, level of care, mulberry variety and navigation. For example, according to N.M. Finaeva, the coefficient of hardness of seedless and Khasak mulberries in Tajikistan during the spring worm feeding was 3.9-4.7%, and in summer -5.0-5.9%. Vaccination and SANIISH - at the age of 1-3 and 5 years of the blue worm on 6 varieties, this figure is 2.8-3.1, 3.0-3.3, 3.5-4.3%, in the summer worm -2.2- It is noted that 3.5, 3.7-3.8, 4.7-5.1%.

According to the experience of M. Gurdaeva, the coefficient of hardness in terms of

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leaf ripening in summer varieties and Khasak mulberry - 26 / IV (2.5-3.1), 3 / V (3.1-3.9), 16 / V (4.0-5.9), 11 / VII (3.7- 4.9), 21 / VII (4.4-6.2), 2 / VIII (5.8-7.0), 29 / VIII (6.4-8.4), 28 / IX (7.4-10.2), 21 / X (8.4-11.2)%. From the above data, it can be seen that in Tajikistan seedless, grafted and Summer varieties SANIISH-6 and Hasak mulberries have a slightly lower roughness of leaves, and their leaves are well eaten and digested by worms. Worms that consume these leaves wrap themselves in heavy cocoons and become seripak.

Proteins in the leaves. Proteins are high-molecular organic substances composed of amino acids. Because protein plays the most important role in vital processes, the structure of the cell, it is called a protoin, i.e. Greek proteius - primary. Proteins are divided into two major groups: 1) proteins consisting of amino acid residues or simple proteins, and 2) complex proteins consisting of proteins or simple proteins and non-protein substances.

Protein is of great importance in the life of the silkworm and is the main source of silk production. As the amount of protein in the leaf increases, the cocoon mass and silk production increase.

To determine the amount of protein in a plant, the total nitrogen in the leaf of the plant being tested is first found. Plant proteins contain between 14.7 and 19.5% nitrogen, which is on average 16%. In this case, the conversion factor is 100: 16 q6, 25.

Therefore, the amount of crude protein is determined by multiplying the total amount of nitrogen under test by a factor of (6.25). Crude protein is always more than the amount of real pure protein, because in addition to the broken down protein, there are also protein-free nitrogen compounds.

The amount of pure protein (%) in the leaves varies depending on the period of growth and variety of mulberry (in% of dry matter)

Table 3

Varieties	Periods								
	Spring			Summer			Autumn		
	26/IV	3/V	16/V	11/VII	21/VII	2/VIII	29/VII	28/IX	21/X
Pioneer	24,9	21,6	19,7	20,4	17,5	16,2	14,8	12,6	11,6
Tajikistan is seedless	29,4	24,6	23,1	25,7	24,1	23,6	20,5	18,7	15,4
Khasak	29,5	24,1	21,9	20,4	19,3	17,5	17,1	14,8	13,2

The table shows that from spring to autumn, the protein content of the leaves gradually decreased. For example, the average for varieties was around 22-25% in spring and 13-18% in autumn. At the same time, the seedless mulberry leaves of Tajikistan have the highest protein content during growth. The pioneer variety is the lowest and the Khasak is the average.

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N.M. Finaeva found that the leaves of different mulberries grown under the same conditions are eaten by worms and the level of digestion of protein in them varies depending on the variety. For example, in comparison with Khasaki mulberry, the leafless variety of Tajikistan has a leaf yield of 4.52%, protein digestion and assimilation rates are higher by 8.21 and 8.02%. CALCULATION - In contrast to the eating of leaves of 14 varieties, in contrast, these figures decreased by 11.6-10.4%.

This means that the silkworm, which consumed the leaves of the seedless mulberry in Tajikistan, had a high level of protein metabolism and produced more silk. According to a study by the same scientist during the spring and summer worm feeding, leaf proteins are composed of free and bound amino acids, which, together with mono- and disaccharides (sugars), have a direct effect on silkworm productivity.

Yu.B.Filipovich was able to determine the amino acids in the leaves by chromatographic method.In the chromatographic method, standard amino acids and comparative leaf and worm feces are diluted in certain preparations and dropped side by side on a specially designed paper tape. Ominograms are formed by repeated exposure to various projavitels.

Based on this, a piece of paper with traces of various amino acids in this or that nas leaf and the worm feces consumed by it is taken and their amount is determined in%.

In 1963-1964, IN Shalmin, Yu.B. Filipovich, Z.A. Voskresenskaya identified 17 different amino acids in the leaves of 4 varieties growing in Uzbekistan, including the mulberry Hasak mulberry.

When examining the amino acids in the leaves during the spring and summer seasons, NM Finaeva calculated these parameters in a total of 8 varieties by chromatographic method. Of the amino acids, lysine, serine, arginine, leucine, isoleucine, and histidine, proline, and cystine-cystine were found to be the least digestible by silkworms.

The sugar content of the leaves. This substance (carbohydrates) is a representative of the lower molecules of the class of monosaccharides and oligosaccharides. Although they are a source of energy in silkworms, they play an important role in protein accumulation in the body (especially during the adult worm and fungal transformation period).

This means that the sugar content of the leaf varies depending on the variety, the location of the leaf on the branch (increasing as it goes down), the increase in the evening, and the decrease in sugar when there is a lot of moisture. The leaf is the most nutritious for silkworms when the sugar content in the leaf is 7-9% in spring and 10-12% in summer and the sugar-protein ratio is around 0.72.

The relationship between total sugar content and sugar-protein content in the leaves depending on the feeding season.

Table 4

Varieties Leaf preparation times depending on the worm feeding season

Spring Summer Autumn

	Spring			Summer			Autumn		
	26/IV	3/V	16/V	11/VII	21/VII	2/VIII	29/VII	28/IX	21/X
Summer	10,1	11,1	12,4	10,6	10,7	10,2	10,3	12,0	9,8

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Tajikistan is seedless	12,8	13,7	14,5	13,8	14,1	13,8	14,1	14,6	11,8
Khasak	12,9	13,6	14,2	13,6	13,9	14,0	13,7	14,4	11,6
Summer	0,35	0,46	0,54	0,44	0,48	0,47	0,55	0,69	0,67
Tajikistan is seedless	0,43	0,55	0,63	0,53	0,58	0,58	0,70	0,78	0,77
Khasak	0,44	0,65	0,69	0,68	0,72	0,75	0,81	0,97	0,87

P.A. Lebedev examined the leaves of the local Hasak and Kanroso mulberry varieties of Japan and found that their fat content increased with the development. For example, in relation to the absolute dry matter of Khasak and Kanrosa, the oil content is 3,482.96 in the spring (27 IV to 21 V), 8.09-5.28 in the summer (28 / V - 10 / VII), and autumn (15 / VIII - 17 V). In X) - 11.0 - 10.3%.

According to the experience of NMFinaeva, SANIISH - 14, in Tajikistan seedless and Khasak mulberries have an average of 3.11-, 711-4.05% of the fat content in the leaves, and in summer 6.31-6, 48-7.27%. formed According to both authors, the low leaf fat content increases from spring to autumn and differs only slightly by variety. In particular, Hasak mulberry, which is highly adapted to local conditions, was more abundant, and SANIISH-14 and Japanese variety Kanroso had the lowest and most nutritious Tajik seedless mulberry.

Leaf fiber. This complex organic substance is a polysaccharide, the main component of the cell membrane of plant cells (cellulose), which is the building material of plant tissues. Fiber is not digested in the silkworm, that is, it has no nutritional value. However, some scientists believe that fiber is involved in accelerating the absorption of other nutrients in the dry body and improves fecal excretion, and therefore the worm's need for this substance increases with age.

Experiments by P.A. Lebedev revealed that the composition of pure fiber in the leaf - cellulose, hemicellulose, lignin, cuticle, pentosan, crude protein and ash elements.

According to the staff of the Central Asian Silk Research Institute, the amount of fiber (especially Hasak mulberry) increases during the feeding of worms on the leaves of blueberry worms, then partially decreases, and at the end of growth increases slightly more. The Japanese tutti Kanrosa declined sharply in early May (11.5%) and in June-August (8.7-9.0%) and increased again at the end of growth (9.1-9.3%).

According to the method of S.M. Prokoshev, 0.5 g of sample leaf D is dissolved in metophosphoric acid, and from this solution it is extracted and expressed in mg /%. According to NM Finaeva, the amount of C drug in the leaves of 3 varieties is given in Table 5.

The amount of C drug in the worm feeding season and varieties, in mg /%.

5 - table

Age of the worm at the time of analysis	By varieties in the period of Capricorn and summer worms		
	SANIISH - 14	varieties of Tajik seedless mulberry	Khasak mulberry

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	spring	summer	spring	summer	spring	summer
1 – age	136	248	165	327	232	367
2 – age	201	266	192	343	255	386
3 – age	245	246	237	328	284	357
4 – age	255	186	263	279	317	284
5 – age	233	160	318	228	358	237

The level of ascorbic acid in the leaves during mulberry growth is of particular importance in multi-season worm feeding. (Table 5).

According to Table 5, the composition of the leaves of 5 cultivars was the highest in spring, moderate in summer and low in autumn. As the age of the worm increased during the spring and summer seasons, the amount of C drug also increased. In the fall, it decreased.

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