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Establishing intensive bushy mulberry groves depending on climatic conditions and methods for determining nutritional leaf yield

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Abstract
In the cultivation of fresh tender mulberry leaves, which are a source of food for cocoon producing farms and specialized farms engaged in silkworm breeding in the country, a sericulture sector will be more profitable sphere in the short term due to a sharp increase in leaf yield and amount of productive cocoon in Khorezm region through establishing intensive bushy mulberry groves with new regionized mulberry varieties and hybrids.

Keywords: feeding base, nutritional, mulberry leaves, varietal mulberry seedling, intensive bushy mulberry grove, inter-rows

Introduction
In recent years, the greater attention has been paid to the development of sericulture, especially to its source, that is mulberry growing through the propagation of new nutritious mulberry varieties and the cultivation of varietal seedlings, and the yield of mulberry leaves that are regarded as silkworm feed, require the achievement of a specific goal at the expense of varieties and planting more seedlings. Particularly, intensive mulberry groves are being created from varietal and productive seedlings.

In this regard, by the decree of the President of the Republic of Uzbekistan from March 20, 2018 numbered PD-3616 “About the additional measures on further development of sericulture sector” and another decree from January 17, 2020 numbered PD-4567 “About additional measures on the development of silkworm feed base in the sericulture sector”, the tasks like introduction of new innovation techniques and technologies into cocoon farming, establishing new mulberry tree groves and nurseries, expanding mulberry planting areas throughout the republic, application of water-saving irrigation technology in mulberry growing, building constructions and establishing facilities for silkworm breeding, reviewing the activities and reconstructing the present constructions of silkworm breeding, and then presenting them for future silkworm breeding practices were set for implementation.

In fact, in the areas of the Republic specialized in cocoon production, mulberry trees are planted along roadsides and ditches, on the edges of cotton fields. Accordingly, these mulberry trees planted in a row form make up about 85-90% of mulberry trees which provide cocoon raw materials in the districts.

However, the profitability from the use of mulberry trees planted in this way is much lower, i.e by the time silkworms are bred, and disease and pests controlling season, all species of the trees, including mulberry trees are treated. In this regard, in order to avoid external factors and to obtain high leaf yields from seedlings, the use of bush mulberry tree groves yields much more from the first year than the tall mulberry trees. Due to cutting bushels and twigs in the bush mulberry groves from ground surface part in spring each year for leaf yield, allows treatment with the help of agro-techniques and mechanization that can go inside between the trees. Therefore, by the time of leaf yield of bushy mulberry groves planted as per 4x0,5m, 4x1m, 0,3x0,5m, 3x1,0m, 2,5x0,5 scheme and intensive mulberry groves of 0,90x0,90m, 0,90x0,20m, 1x0,5m schemes, intercropping is performed at inter-rows. Mineral and local fertilizers applied to these inter-crops can be an additional nutrition for mulberry trees. Considering this, for rational use of mulberry groves and leaves, practical work and measures

are being taken in the farms specialized in mulberry growing according to the tasks set in adopted decrees.

Accordingly, in Hazarasp district of Khorezm region, over the past 3 years, 100 hectares of mulberry trees grove has been established due to the renewal of old mulberry trees by planting new seedlings. In particular, the bushy mulberry groves, built from cuttings, allow to use the leaves from the second year. We can see this from the data given in the table below.

Table 1: Leaf yield of intensive bushy mulberry groves from the second year (at the expense of different mulberry varieties)

No	Name of variety or hybrid of mulberry tree	Per hectare, centner	Relative to control, %
1.	SANIISh-5	149,8	214
2.	Kokuso-70 x Pioner	116,5	166,4
3.	Kinriu	167,3	239
4.	Pobeda x Pioner	151,1	215,8
5.	Comparing mulberry trees	70,0	100

It is clear from the table data that the leaf yield of groves in the second year was recorded to be 2,0-2,5 times higher than the groves grown by seeds. Cultivation of mulberry trees from the cuttings is widely used in other regions of the republic too. In order to establish sustainable high-yielding and fresh nutritious feed base for sericulture, propagation agro-techniques of seedlings from the seeds and ringed cuttings (vegetative) was developed, and cultivation of cocoon raw material was implemented in the districts. The following table provides information on the first year development of the intensive type bush mulberry grove created from cuttings.

Table 2: Growth rate and determinability indexes of bush mulberry groves established under optimal scheme

No	Name of varieties and hybrids of mulberry tree	Number of sprouted shoots, pieces	Shoot length		Thickness of shoot base, cm
			average, cm	sum, m	
1	Uzbekistan	3	271	8,13	1,6
2	Kokuso-70 x Pioner	3	238	7,14	1,4
3	Kinriu	3	233	7,0	1,5
4	Pobeda x Pioner	4	229	9,16	1,7
5	Balkhi (Manassas) mulberry not ringed	2	219	4,4	1,4
6	Layered not ringed	2	216	4,3	1,4

Depending on the cuttings three or more shoots (branches) are formed from each cutting prepared from mulberry hybrids or varieties with their own roots.

Indeed, the nutritional quality and nutritional value of grown mulberry leaves are determined by the degree to which they are eaten and digested by the silkworm and the amount of silk mass produced.

Consequently, there is an inextricable link between the nutritional quality of the leaves and the silk mass wrapped by the silkworm that consumed these leaves and the amount of silk. The study of the nutritional quality of the leaves is of great importance in improving the agronomic techniques of mulberry tree care, the use of mulberry leaves for silkworms and the cultivation of new varieties. In general, the nutritional value of a leaf is determined in 3 different ways: biologically-by feeding worms, chemically-by determining the elements in the leaf, physically-by determining the physical properties of the leaf. Among these, the biological method is real and effective one.

Actually, in order to biologically assess the leaf quality of mulberry varieties or hybrids, silkworms belonging to a particular breed or hybrid are fed on their leaves. In this case, 300 and a total of 900 worms are fed by repetition, and another 300 additional worms are fed in order to compensate for the fact that their number does not decrease during the feeding of mulberry silkworms. Quality control should be arranged in two periods (at 7-8 A.M in the morning and at 7-8 P.M in the evening) and mulberry leaves should be stored in a cool place under polyethylene film until they are given to the larvae. The leaves of each mulberry variety or hybrid are weighed before feeding the worms and this process is carried out at the same agronomic level. The coefficient of mulberry leaf consumption during this agrotechnical period is determined by the method of A.G Kafian (1970) as follows.

$$h = \frac{g}{f}$$

here, h-consumption coefficient, g-consumed leaf and f-amount of given leaf. In the research work of U.Nasirillaev (1975), N.M. Finaeva (1978), B. Kenjaev (1981), M. Gurdaeva (1982) and others, the surveys were performed on determination of nutritional quality of mulberry varieties by biological and biochemical methods. In the experiments of U. Nasrillaev and B. Kenjaev, it was found that when the worms were fed on the leaves of Tajikistan seedless mulberry variety, the farm valuable traits of the worm were passed much more on to the next generation compared to Pioner variety. The scientists studied in the laboratory that chemical composition of the leaves varies mainly depending on the type of mulberry, the level of care, methods of use for silkworms, i.e. the location of the leaf on the shoots of each tree and the age of the mulberry. The sample leaves should be of average size, separated from the shrubs and tall mulberries growing in different places, and prepared by pinching from the inside of the shoot and the lower, middle and upper parts on the north, south, west and east sides of shoots and sent for analysis. According to M. Asomova's research (1977), it is recommended to feed silkworms in the morning time and after the second half of the day on the leaves brought in the evening, because hygroscopic water in the leaves increases in the evening time and the leaves become nutritional, fresh and qualitative.

Scientists also determined that the amount of protein in the leaves depends on mulberry variety.

This process was studied in our research work, and the amount of protein was on average 22-25% in spring, 15-25% in summer and 13-18% in autumn. At the same time, seedless mulberry leaves of Tajikistan varietyhave the highest protein content during growth, the lowest in the Uzbekistan variety and the average in the Hasaki variety.

Table 3: Variation of pure protein amount in the content of mulberry leaf depending on growth period and varieties of mulberry (respectively to dry matter, %)

No	Mulberry varieties	Sample collection terms according to silkworm feeding season								
		26/IV	3/V	16/V	11/VII	21/VII	2/VIII	29/VII	28/IX	21/X
1	Uzbekistan	24,9	21,6	19,7	20,4	19,3	16,2	14,8	12,6	11,6
2	Tajikistan seedless variety	29,4	24,6	23,1	25,7	24,1	23,6	20,5	18,7	15,4
3	Hasaki (Control)	29,5	24,1	21,9	20,4	19,3	17,5	17,1	14,8	13,2

As it is known from the table data that the amount of protein decreased step by step from spring to autumn. For example, by the varieties it was on average 20-25% in spring, 14-25% in summer and 13-18% in autumn.

Depending on the feeding season of worms, the relationship between total sugar content and sugar-protein content in the leaves can be determined on the basis of M. Gurlaeva's data.

Table 4: Variation in the relationship between total sugar content and sugar-protein content in mulberry leaves depending on the feeding season

No	Mulberry leaves of the experiment	Leaf preparation time depending on silkworm feeding season								
		Spring			Summer			Autumn		
		26.04	3.05	16.05	11.07	21.07	2.08	29.08	28.09	21.10
Sugar, as a dry matter										
1.	Summer	10,1	11,1	12,4	10,6	10,7	10,2	10,3	12,0	9,8
2.	Tajikistan seedless mulberry	12,8	13,7	14,5	13,8	14,1	113,8	14,1	14,6	11,8
3.	Hasaki	12,9	13,6	14,2	13,6	13,9	14,0	13,7	14,4	11,6
Sugar, interrelations of protein matters										
1.	Summer	0,35	0,46	0,54	0,44	48	0,47	0,55	0,69	0,67
2.	Tajikistan seedless mulberry	0,43	0,55	0,63	0,53	0,58	0,58	0,70	0,78	0,77
3.	Hasaki	0,44	0,65	0,69	0,68	0,72	0,75	0,81	0,97	0,87

Fiber is more abundant in mulberry leaves in the morning than in other periods, and begins to decrease in the evening. It was also studied in the research that the active acids in the leaves also play a role in improving the quality of the leaves, and these active acids were identified in the experiments on the silkworms, and the following conclusions and results were substantiated.

1. The activity of the reaction in the blood of silkworms is H=6.70-6.80 during the worm and pupa periods. During the peeling of the worm, the acids are reduced.
2. The activity of the reaction in silkworm blood is inextricably linked with the reaction in feed, that is, the pH in the blood of worms decreases with increasing acidity in the feed.
3. If the highest level of active acid in the mulberry leaf is pH=5.7 for silkworm, then it dies. For normal growth of mulberry silkworm, the pH should be around 6.7-7.8.
4. Actually, young leaves are sour. As they ripen, the sourness decreases. The tip leaves on the shoots are also sour, and the acidity decreases as they take lower part of the shoot. In spring, the leaves contain more active acids than in summer and autumn. The amount of vitamin C in the leaves also plays an important role in the feeding of mulberry silkworms and contributes to an increase in cocoon productivity as a result of integration with other elements.

In general, the experiments conducted in the cocoon-producing areas show that the viability of silkworms which consume the leaves of such mulberries, increases, the weight of the cocoon and silkiness are higher. When all microelements tested on production control are mixed with minerals and local fertilizers and then given to silkworms, they show a major impact on silkiness of cocoon yield, technological properties and product quality as well.

In conclusion we can say that the abundance and quality of the food source of sericulture requires the study of climatic and soil conditions of each region and the regionalizing of mulberry varieties that are tested by planting in these areas. The rational use of their leaves, depending on the age of the worm and the season of feeding, makes it possible to turn sericulture into a profitable and cost-effective industry.

References

1. Decree of the President of the Republic of Uzbekistan from March 20, numbered PD-3616 About additional measures on further development of sericulture sector. Tashkent, 2018, 1-4.
2. Decree of the President of the Republic of Uzbekistan from January 17, йил numbered PD-4567 About measures on the development of feed base of silkworm of sericulture sector. Tashkent, 2020, 1-6.
3. Kuchkorov U, Kholmatov D. What are considered for establishing intensive mulberry groves?// Uzbekistan agriculture, No 4. Tashkent, 2013, 18.
4. Kuchkorov U, Kholmatov DI, Juraev M. Regionized and perspective mulberry varieties. Recommendation. Tashkent, 2010, 6-10.
5. Rajabov NO. Chemical content of leaves of new mulberry varieties. // Agroilm, No 2. Tashkent, 2018, 74.
6. Bekkamov CHI, Sokhibova NS, Zikirova MO. Efficacy of the system for establishing intensive mulberry groves and using varietal mulberry leaves.// Uzbekistan agrarian bulletin, No 1(75). Tashkent, 2019, 125-127.