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THE INFLUENCE OF THE EXTERNAL ENVIRONMENT ON THE BIOLOGICAL AND TECHNOLOGICAL PROPERTIES OF COCOONS

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Abstract
In addition to heredity, the biological and especially technological properties of cocoons are greatly influenced by the conditions of cocoon wrapping - temperature, humidity, light, ventilation (aeration), the quantity and quality of cocoons.As a result of temperature changes during cocoon wrapping, the speed and nature of the silkworm wrapping the silk fibers into the cocoon shell of the worm also change.

Keywords: Cocoon, cocoon, temperature, humidity, varietal cocoons, spotted cocoons, biological indicators, mulberry leaves, high productivity, preserved live cocoons, cocoon production, live cocoon, productivity, varietal cocoons, technological indicators.

Introduction

As the temperature increases, the speed of movement of the silkworm also increases, and the oscillation width of the head increases. Therefore, the octagons are also formed larger, and the silk fiber becomes thinner. Silk production during cocoon wrapping consists of two processes: on the one hand, the body of the silkworm is compressed by pressure on the silk separating gland, under the influence of which the silk mass is pushed towards the compression apparatus. There is always a drop of liquid silk on the end of the tube (it must be a drop of sericin), the silkworm touches the tube to a point, sticks the end of the silk fiber

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in place, and shakes its head to pull the silk fiber out of the tube. The faster this movement, the thinner the silk fiber will be, because the silk mass is mechanically stretched too much.

At a temperature of 21^{0}C, the silkworm forms a single octopus with a height of 3.5 mm in 3.17 seconds and a silk fiber thickness of 24.91 microns, with a silk fiber release rate of 2.11 mm per second. At a temperature of 29^{0}C, the silkworm produces octopuses of 4.6 mm in height, which takes only 1.69 seconds for each octopus, the thickness of the silk fiber decreases to 20.43 microns, and the rate of octopus formation increases to 6.01 mm per second.

Main part

One of the main technological properties of silk fiber is its metric number and its non-uniformity. At the beginning of the cocoon wrapping period, the silkworm produces thick silk fibers with a low metric number of 2,500-3,000. will have. Typically, the metric number of the last end of the silk fiber in a single cocoon is two to three times greater than the metric number of the silk fiber at its beginning. The number of silk fibers, depending on its average amount, usually varies from 17-25% within a single cocoon and between 12-18% between cocoons. The larger the average metric number of the silk fiber, the less the diversity within and between the cocoons, and the higher the technological properties of the cocoons. The variety of thicknesses of silk fibers plays a particularly big role in the automatic spinning of silk from cocoons, which are now widely used in our silk factories.

The temperature conditions of cocoon wrapping affect the metric number of silk fibers to vary, as well as technological parameters such as cocoon sericity and silk yield. The yield of silk, on the other hand, is directly related to the tensile (elasticity) property of the cocoons, which depends on the state of sericin. Interesting data have been obtained as a result of research on the processes during cocoon wrapping. In particular, when the temperature rises to 25-26^{0}C during cocoon wrapping, the cocoon wrapping time is generally reduced, the average metric number of silk fiber is increased, its variety is reduced, the cocoon is seripak and silk fiber is produced more. Also, when the temperature rises to 28-29^{0}C, the metric number and diversity of the silk fiber further increases, but in return the cocoon silk is significantly reduced and the silk fiber is produced very

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little. Thus, it was found that both low (21-23^{0}C) temperature and high (28-29^{0}C) temperature during cocoon wrapping reduce the biological performance and technological properties of cocoons, 25-26^{0}C is a good temperature. It is best to have a decreasing temperature, ie 26^{0}C on the first day of cocoon wrapping, 25^{0}C on the second day and -24^{0}C on the third day. The cocoons obtained at this temperature have high technological properties. This condition is especially favorable for the uniformity of the thickness of the silk fiber: if at 21^{0}C the variation in the thickness of the silk fiber is 23%, at 25^{0}C it is 19.4% and at 270 it is 15.5%. This means that if the temperature in the cocoon during the cocoon wrapping period is gradually reduced over the days without being kept at a moderate level, the worms will rapidly cocoon and the silk fiber will come out flat and the technological properties will be good.

The relative humidity of the air during cocoon wrapping also plays a big role. When the relative humidity is high 80-85% (although all other conditions are favorable), the biological performance and technological properties of cocoons deteriorate significantly. Silk pulling from the cocoon and raw silk output is particularly declining. When the air temperature is low and the relative humidity is low, the average mass of the cocoon decreases. When both humidity and temperature are high, silkworms wrap a lot of cocoons, but the cocoon shell becomes porous and unsuitable for pulling silk.

Results and Discussions

Many years of scientific observations and experiments of advanced cocoons have shown that when the relative humidity of the air in the room during cocoon wrapping is 60-70%, it is desirable that the biological and technological characteristics of the cocoons meet the requirements.

The level of illumination of the cocoons wrapped by the worms also causes the thickness of the silk fibers to vary. When the pods are illuminated unilaterally, the percentage of variation in the thickness of the silk fiber increases, while when uniformly illuminated in all directions, or when the whole area is uniformly darkened, the variability decreases.

According to N.Akhmedov (2004), an increase in air temperature of 28^{0}C and humidity of 80%, as well as a temperature of 21^{0}C and humidity of 80% reduce the overall productivity of silkworms and reduce the quality of raw materials. In

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addition, the norm (relationship) between the sponge and the cocoon shell is violated. In low temperature and high humidity air and in low humidity the opposite is lighter.

According to Professor N.Akhmedov, worms are very sensitive and sensitive during cocoon wrapping, and even a slight stimulation of them has a negative effect. Although the cocoon wrapping conditions change slightly, the worm continues to weave the cocoon, but the process of removing the silk fiber is disrupted, affecting the technological process.

The quality of the cocoon, ie the size, shape, weight, percentage of the shell, hardness and its technological properties are greatly influenced by the yield of silk, wrapping, fiber length and toughness. reaches

When the temperature is low, the cocoon wrapping period lasts 7-10 days and many worms cocoon in Ghana, as well as the number of worms left unwrapped. Excessive temperatures accelerate the cocoon wrapping process, resulting in an increase in the number of cocoons that are bumpy, spotty, and deformed. When the temperature is high, the worms place the silk fibers randomly in the cocoon shell, which in turn reduces the washing of the cocoons and the release of raw silk from the cocoon. For high-yielding cocoons, which have recently been introduced into production, it is recommended that the temperature during cocoon wrapping be 25ºC and humidity 60-70%.

With this in mind, in our study we initially aimed to study the effects of varying temperature and humidity on cocoon wrapping, maturation, yield, and biological performance. According to the study, when the temperature is below 25ºC (20-21ºC) or high (28-29ºC), the worms do not suddenly emerge from the stem, their viability decreases, and often the worms wrap the cocoon in the cocoon (Table 1).

Table 1 The effect of temperature and humidity during cocoon wrapping on the survival rate of the worms and the percentage of exodus

During cocoon wrapping		Worm survival and emergence,%	Cocoon wrapping%	
Temperature ºC	Humidity, %		In ghana	when the handle is placed to wrap the cocoon
21 ºC	77	86,0	24	76
23 ºC	73	87,0	14	86
25 ºC	70	91,0	9	91
28 ºC	65	84,0	6	94

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Table 1 The effect of variable temperature on cocoon wrapping on the maturation, quantity, variety and yield of silkworm cocoons

Worm feeding and cocoon wrapping		The ripening of the cocoon	Total wrapped cocoon, %	Quantity of cocoons, %	Yield of cocoons from a box of worms, kg
Temperature ºC	Humidity %				
20-21	65-70	12	82	78	68
20-21	80-85	11	80	76	70
24-25	65-70	9	90	93	78
24-25	80-85	9	90	91	71
25-26	65-70	8	93	94	82
28-29	65-70	7	85	87	64
25-29	80-85	7	84	85	63

It was found that a sudden change in the temperature in the cocoon during cocoon wrapping affects the maturation of the cocoon, the amount of cocoons wrapped, the percentage of Variety cocoons and the cocoon yield obtained from a box of worms. For example, cocoons are harvested in 11 days at a temperature of 20-21 ºC, 9-10 days at a temperature of 24-25 ºC, 7-8 days at a temperature of 28-29 ºC, and 8 days at a temperature of 25-26 ºC. consumption was known. From these data, it can be seen that the decrease in temperature during cocoon wrapping indicates that the cocoon matures for 3 days, while the temperature exceeds the norm, which is reached the day before. At the same time, the moisture content of the elongated cocoons was found to be slightly higher than normal. It has been found that cocoon maturation accelerates when the cocoon is wrapped at high temperatures and that the cohesiveness of the cocoon fiber increases.

Similar differences are also seen in the total number of coiled cocoons. In particular, 78-80% of worms at low temperatures are cocoons at an average temperature of 88-90%, 82-83% at high temperatures and finally 92% at moderate temperatures and humidity. 90-92%, 94% at 25-26 ° C and 84-86% at 28-290 ° C. This means that when the cocoon wrapping is at a low temperature, the total number of cocoons wrapped by the worms is 78-80%, which is 2-4% higher than at the moderate temperature (92%) and 82-83% when the temperature is high, which is 9% higher than the control option. It was found to be as low as 10%. It was also found that there was a drastic change in the cocoon yield from a box of worms. For example, the cocoon yield from a box of worms is 66.8-68.3 kg at low temperatures, 72-81 kg at medium temperatures, 54-63 kg at high

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temperatures, and in the control variant this figure is 83 kg. was found to vary from 2 kg to 20 kg compared to the other options.

If the cocoon wrapping conditions are poor, the amount of defective cocoons will increase. A drop in temperature of 20-23°C or more than 28 degrees Celsius can lead to an increase in the number of cocoons that are deaf / dead inside the cocoon, dead, but without spots on the outside, and black-spotted / dead inside the cocoon. adversely affects the property.

The effect of variable temperature and humidity in the cocoon during cocoon wrapping on the biological parameters of the cocoon (average weight, cocoon shell weight and silkiness) is shown in Table 3.

Table 3 Пилла ўрашда кескин фарқ қилувчи ҳарорат ва намликни пилла кўрсатгичларига таъсири

Worm feeding and cocoon wrapping		Worm feeding and cocoon wrapping	Weight of silk shell, mg	Silk %	Yield of cocoons from a box of worms, kg
Temperature ºC	Temperature ºC				
20-21	65-70	1,98	440	22.2	68
20-21	80-85	2.00	450	23.0	70
24-25	65-70	2,15	505	23.5	78
24-25	80-85	2,05	480	23.4	71
25-26	65-70	2,18	520	23,8	82
28-29	65-70	2.02	450	22.3	64
28-29	80-85	1,90	430	22,6	63

The data in the table show that a sudden change in temperature during cocoon wrapping leads to a reduction in the average weight of a cocoon, a decrease in the weight and silkiness of the cocoon shell. For example, when the worms are in the cocoon wrapping temperature (25-26 ºC), the weight of one cocoon is 2.12 g, which is 1.94-1.95 grams at low temperatures and 1.86-1 at high temperatures. 97 grams, a decrease of 5.5-12.7% compared to the control variant. It was found that such a change also occurs in the weight and silkiness of the silk shell, ie the weight of the silk shell decreases by 2-20%, the silkworm by 0.3-2.0%.

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Conclusion

The relative humidity during cocoon wrapping has a major impact on the quality of the cocoon.At the beginning of the cocoon wrapping period, the relative humidity may increase, for example. The silkworm evaporates a lot of water from the body during the cocoon wrapping period. In addition, uneaten leaves, stalks, and poorly dried stalks also evaporate water. Increased humidity leads to conditions for the growth of microorganisms and the spread of disease, resulting in the death of many worms and a decrease in the quality of the cocoon.

When the relative humidity of the worm air decreases below a moderate level, the evaporation of water from the leaf surface of the worm body increases.

During the cocoon wrapping it is necessary to constantly ventilate the barn. There should be no elvizak winds in the ventilation. One-way ventilation is required, otherwise the temperature and humidity may drop. To do this, use special ventilation holes in the wormhole during the day.

The lighting of the cocoon is also important during cocoon wrapping. The moisture in the cocoon rises and mold forms, the worms do not wrap around the cocoon to the end, affecting the cocoon crop. That is why the windows and windows of the courtyard are covered with paper.

Some worm breeders stop feeding when the worm begins to wrap the cocoon, cover the worms by covering the stalks with a cloth or cloth.

Not all of the worms in the batch start packing cocoons at the same time. Usually the worms come out of the bunch in 1-2 days. On the first day 8%, on the second day 40%, on the third day 46%, on the fourth day 6% worms come out.

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