



Requirements For Lucerne Seed Production And Quality

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ABSTRACT

The existing agricultural technology for the production of lucerne seeds in various zones of the country is analyzed. The technology of cleaning and storage of lucerne seeds from seeds of quarantine and weed plants, as well as the requirements for the quality of seed material, are given.

Keywords:

Lucerne, Seeds, Cleaning, Technology, Quality Indicators.

Lucerne was cultivated in Central Asia several thousand years ago as the highest quality fodder crop for animals. Compared to other plants, lucerne is a grain, vegetable, and multi-leaf plant due to the softness of its stems and leaves, an abundance of protein, vitamins, and trace elements in its composition, ability to freely absorb nitrogen from the air with the help of bacteria in the root nodules, improve the physical and chemical properties of soil, reduce its salinity and increase its productivity and are widely implemented in crop rotation with cotton.

In recent years, the area under cotton has been reduced and special attention has been paid to expanding the area under vegetable, rice, and livestock crops. It is especially encouraging that lucerne, one of the main crops to create a fodder base for livestock, is given attention at the state policy level.

Lucerne is rich in vitamins and contains vitamins A, B, C, D, E, and P, which is important for evaluating the nutritional value of feed. The plant contains 14-25% protein, 25-27% fiber, 2.5-3.0% oil and 45-48% leaves. Cattle-fed lucerne are more productive, more prolific, less

susceptible to disease, and exhibit other positive qualities [1].

As a staple feed for cattle, lucerne is a resource that improves soil structure and increases the yield of crops planted after it.

Lucerne collects nitrogen bacteria around its root, thereby improving the properties of grit, water, and air in the soil. Three-year-old lucerne accumulates 600-900 kg of pure nitrogen per hectare. The root shoot, in some areas, reaches 6-8 meters, sometimes 10-16 meters. For this reason, lucerne's drought tolerance is much higher than that of some plants. Lucerne roots penetrate deeper into the ground (up to 10-16 m) and leave 15-20 tons of organic residues (roots and stems) per hectare in the fertile layer. This organic residue is a balsam for the soil and provides the same strength as 10-12 tons of local manure per hectare. Therefore, when cotton is sown instead of lucerne in the crop rotation, yields increase by 5-7 quintals, and by up to 10 quintals when the grain is sown [2].

Lucerne reduces groundwater subsidence and partially performs ameliorative functions [3]. It should be noted that lucerne plays an important role in eliminating some

negative environmental factors. It prevents rapid reduction of moisture in the soil, and secondly, prevents migration of salts from one place to another in areas with increased salinity (Republic of Karakalpakstan, Bukhara, Khorezm, and Syr Darya regions). It also prevents the development of some pathogenic elements - fungi, bacteria, viruses, etc. and creates a healthy environment for preceding crops. For example, according to scientific sources, the cotton-lucerne crop rotation scheme is the main method of eliminating wilt disease, which appears in cotton and causes great damage [11].

Soil and climatic conditions in Uzbekistan require the proper application of agronomic measures at the optimal level to regularly obtain abundant lucerne seed yields from irrigated lands. By its biological characteristics, seed lucerne is completely different from hay lucerne and requires special care. It is advisable to plant lucerne sowing on land free of cotton, grain, corn, vegetables, and other crops. When preparing the soil for planting, gray fields are plowed to a depth of 10-12 cm with toothed cultivators. Adding 20-30 tons of decomposed manure and 3-5 cwt of superphosphate per 1 ha before plowing will create favorable conditions for improvement of their agrophysical properties, healthy development of sowing lucerne, and increase yields. Deep plowing with GR-2,7 unit is especially beneficial on saline soils.

Pure sowing of conditioned lucerne seeds without mixing with seeds of other crops is carried out in early spring. At this time, seeding is a grain-grass (SZT-3,6; STS-2,1; STS-47; Premium-30 CUN (France), etc.) or other vegetable seeders (SON-2,8; SKON-4,2; SO-4, 2, etc.) are sown to a depth of 2-3 cm (1-2 cm in hard soils) in seeders. Sowing to a depth of 4 cm reduces its germination from 70% to 45%, and sowing to a depth of 6 cm reduces the germination to 12% [1].

In most farms of the country, lucerne seeds are grown in the open field, and to obtain more nutritive mass from lucerne sown in the first year, as mentioned above, it is sown in a complex with cereal crops. In this case, the lucerne sowing rate is increased to 16 kg/ha

(Sudan grass sowing rate is 5-10 kg/ha). Simultaneously with planting or the next day make furrows for water at a distance of 60 (70) cm from each other [4].

In the climatic conditions of Uzbekistan, lucerne is sown not only in early spring but also in autumn. In this case, the seed will turn blue and root the same year, and by winter, the sprouts will be stronger and more resistant. It continues to grow as warmer days arrive in the spring, and it is much more vigorous than late spring lucerne planting. It has been noted that lucerne planted in the fall in the first year is 1.5 to 2 times more vigorous than lucerne planted in early spring. Also, fresh seeds from the lucerne crop planted in the fall can be used for planting in the first year.

In experiments with spring sowing lucerne in the first crop of the second year was left for seeds and in other crops for hay, 5.8 t/ha of seeds, 61.1 t/ha of hay, and 69.6 t/ha of straw. In the third year, 5.7 t/ha of seeds, 59.5 t of hay, and 70.2 t of straw were harvested. When lucerne was sown in the fall with fertilization, the first year yielded 5.2 t/ha of seed, 59.5 t/ha of hay, and 64.7 t/ha of straw, and the second year yielded 5.9 t/ha of seed, 62.4 t/ha. /ha of hay and 70.3 t/ha of straw [5].

The first time lucerne is watered is when the height of plants reaches 10-12 cm, and before the first harvest of lucerne planted in the first year, it is necessary to water 2-3 times at a rate of 600-1000 cu.m. per hectare. Watered 2-3 times in each crop, in the next harvests, and in two to three-year beds[6].

Under proper growing conditions, 1 to 5 quintals of seeds can be obtained from lucerne. On irrigated land in Uzbekistan, two- to three-year-old lucerne is left for sowing. Older lucerne fields, especially when reused for seeds, are heavily weeded and insect-infested, which leads to a drastic decrease in yields and contamination with seeds of alien quarantine herbs, which requires sophisticated technology and technical means to ensure seed elimination in lucerne.

In winter and spring in regions with low precipitation and fields with deep groundwater, it is better to leave the first crop of lucerne for seed; in years with high precipitation and in

fields with groundwater close to the surface, seed lucerne is left from the second crop. In central regions, where soil and climate are very favorable for cotton cultivation, it is better if the first crop is harvested for fodder, and the next crop is left for seed when lucerne begins to bloom. In this case, pre harvesting of lucerne should be carried out without delay, before April 25 [6].

In irrigated areas, it is advisable to use a special technique involving cutting, drying, harvesting, and threshing of stalks when the lucerne stem is 60-75% browned. As the harvested lucerne dries up a little, after harvesting it is well shredded and the plump seeds bunch up and turn into dark ripe seeds.

The ZhBA-3,5 at a method of harvesting lucerne seeds separately in piles; DSK-4A; ZhBR-4,2; JNR-4; mowers ZhNU-4 are used as well as mower-dispensers E-301 and KPS-5G (dumping mowed stubble in rows). It was found that from 8 to 12% of the total yield of seeds is lost as a result of their scattering on the mower. To eliminate this disadvantage, UzKhMITI (former SAIME) developed a device for cutter-spreader KPS-5G, catching some of the seeds left under weeds. This device allows to the collection of additional 0,2-0,6 tons of high-quality seeds per hectare. German harvesters Class, Dominator-130, Klyuchi, Sampo-500, etc. In this case, the harvester used PTP-2,4 B; PTP-3A; 34-101A; 54-102; assemblers SK-3U.

In some farms of Uzbekistan seed lucerne is harvested by unit KIR-1,5, harvested mass is taken to the barn and scattered for drying, and after drying passed through the combine and clean the seeds (OVP-20A; OV-10; VS-2; SM-4; ZVS-10; ZVS-20; Petkus-Vibrant K-521, K-522, K- OS-4,5; SU-1,25; Petkus-Giant K-531, Petkus-Super K-541, Petkus-Selectra K-218/1; triplets K-523, K-553, and other firm mechanisms) [8].

In the seed mass collected in the combine and brought to the thresher, together with lucerne seeds there are also weed seeds, leaves, grass, buds, cobs, various insects, and other

impurities. The mixture is 50-80 percent. The humidity of the lucerne pile in the hopper is 16-28 percent. To get the seed that meets the requirements of GOST, it must be dried and cleaned several times. The primary pre-cleaning of lucerne separated large weeds, tubers, and weed seeds, which differ significantly in size and weight from the lucerne seeds. OVP-20A, OV-10, VS-2, CM-4, ZVS-10, ZVS-20, Petkus-Vibrant K-521, and K-522 for pre-treatment of seeds. K-523 and other special machines are used. Unshredded logs are passed through a wood-burning machine and cleaned again in the above-mentioned machines. After that, seed OS-4,5; SU-1,25; Petkus-Giant K-531; Petkus-Super K-541; Cleaned in triers and units K-218/1, trier units K-523, K-553, Triumph, Cuscuta and other sorting machines with a complex winding[9].

Seed cleaning separates weed seeds and other impurities that are difficult to separate. Purification of lucerne seeds begins only after selecting sieves and samplers that separate weed seeds and mixtures by their weight and overhang. Seeds of weeds similar in size and shape to lucerne seeds and difficult to distinguish from each other (leaf grass, red sedge, zarpechak, human, etc.) P-050 with different coating PSS-2 GOST-4601 -73, 5 cleaned on a pneumatic sorting table. Final cleaning of seeds is carried out in electromagnetic installation EMC-1A, CMSch-0,4, equipped with devices humidification steam or water [18].

Trier drums with meshes of 2.2-2.8 mm are installed in UzMEE (former SAIME) instead of 3.5 mm against red warts with meshes of 1.8 mm, recommended for anti-oil treatment. The 2.2 mm mesh drum separates the pellets, and the 2.9 mm mesh drum separates 92% of the reddish mass[10].

For every kilogram of lucerne seed that passes through this cylinder, 80-140 of the smallest, immature, soft, crushed seeds remain, which mix well with trifolin powder and are separated by the EMC-1A electromagnetic machine in percentages.

Table 1.1.

Wheels of an lucerne seed cleaning machine, trier cylinder, and their set of holes or cells[1]

Done- Job	The work of the sieve does	Sieve №	Cylinder diameter or honeycomb shape	Holes or cells size, mm
The first one is this cleanup.	Separation of coarse disperse mixtures	1	Round Long	1.3 - 1.4 2.0 - 2.2
	Separation of fine mixtures	2	Round Long	0.8 - 1.0 0,5 - 0,8
Main cleaning	Separation of large mixtures	1	Round Long	1.5 - 2.0 1.2 - 1.3
		2	Round Long	0.8 - 1.2 0.5 - 0.6
	Separation of additional crop seeds	3a	Round Long	1.1 - 1.2 0.9 - 1.0
	Separation of transitional mixtures	3б	Round	1.6 - 1.8
	Separation of excrement Trier harvesting		Round	1.6 - 1.8

In the EMC-1A electromagnetic machine, the need for raw materials for seed cleaning is very important. This material must consist of at least 80 percent lucerne seeds, must be well dried, and must undergo the following treatment before entering the electromagnetic machine:

- 6 L per 100 kg of raw material. the lucerne seeds are stirred and heated by water;

- 3 kg per 100 kg of raw material. at the expense of trifolin powder is mixed and stirred for 5-7 minutes;

- the material is immediately placed in the hopper of an electro machine (the machines are set in pairs);

- a current of about 8-10 amperes is applied to the electromagnetic drum of the first machine;

- to receive I and II seeds it is necessary to install the receiver cover near the drum so that part of the I seeds falls into the II seeds;

- the seed from the first machine falls into the wide chamber of the second machine, not getting into the hopper (the machines are installed in a row, and the seed is completely cleaned in them);

- auger magnet powder regulator in the second machine must provide 200-250 grams of trifoliolate powder for every 100 kg of seed (in the second machine seeds are additionally cooled)

- the clearance between the tray conveyor and the drum of the second machine must be the same as that of the first machine;

- currently supplied to the drum of the second electromagnetic machine is reduced to 5-8 amperes.

When cleaning seeds according to this technology, cakra and zarpechak seeds are separated in the first machine. In the second machine, the remaining quarantine seeds and crushed lucerne seeds are separated. If most of the lucerne seeds of varieties II and III are germinating, the current supplied to both machines can be reduced to 5-6 amps. In this case, the specified quarantine weeds will also be completely separated. It is necessary to establish laboratory control of the conditioned seed yield (compliance with the requirements of the model). The product prepared as a seed must meet the following requirements[6]:

	super elite	elite
Purity, %	98	98
Perennial weeds		
Quantity, %	0,5	0,5
Number of weed seeds (in 1 kg of seeds), pcs.	50	100
Amount of extraneous seeds, %	0,2	0,2
Germination, %	90	85
Humidity, %	13	13

Cleaned, sorted lucerne seeds with a moisture content not exceeding 13 percent can be stored for a long time. Seeds with excessive moisture should be dried. Sun-drying helps freshly harvested seeds mature much faster. This is important when planting new seeds in the fall. Lucerne seeds are pre-cleaned, disinfected, and stored in dry areas. The germination of lucerne seeds is 5-6 years under laboratory conditions and 15-16 years under storage conditions [7,11]. Also, a dry air environment and average monthly temperature close to 14-16° is one of the important conditions for preserving lucerne seed germination for a long time. High temperature and humidity accelerate lucerne seed respiration, which leads to seed germination, and seeds may die under such conditions.

Conclusions.

1. When cultivating lucerne seeds, full observance of agrotechnical care taking into account the region of cultivation is the main factor in the quality and contamination of the seeds received by seeds of quarantine plants.
2. To ensure that the purity of lucerne seeds from seeds of quarantine plants was at the required level, it is important in time to establish the modes of cleaning equipment at the standard level.

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