

The significance of technical hemp cultivation and biometric indicators of the researched varieties in Uzbekistan

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Abstract. Technical cannabis - the variety planted in the Havos region, which contains up to 0.2% of the narcotic substance tetrahydrocannabinol, is brought from Europe, that is, from France, and it is being cultivated in a very small amount of narcotics. It is necessary to plant the brought collection in the nursery, study it in every way and select varieties suitable for the soil and climate conditions of our Republic, and based on these, create new varieties with the help of selection methods and develop agrotechnology for their cultivation. In our experiment with cannabis plants, we studied the yield characteristics of the seeds, the biometric indicators of the varieties and the amount of oil released from the seeds. Key words: Cannabis plant, tetrahydrocannabinol, yield, disease resistance, fiber yield, new varieties, variety

1 Introduction

Today, the cultivation of industrial cannabis in our Republic is an industry that is slowly recovering from a huge decline. The President signed a law providing for amendments and additions to the Law "On Narcotic Drugs and Psychotropic Substances". According to him, now the cannabis plant can be grown by legal entities for industrial purposes. Cannabis is a plant that contains up to 0.2% of the narcotic substance tetrahydrocannabinol. Of course, this activity is allowed based on the relevant license.

On the one hand, this is a disaster, because industrial cannabis is a truly universal crop that is used in almost any field - from textiles to medicine and cosmetology. In addition, the ability to produce biofuel from cannabis makes the plant an environmentally friendly and efficient energy carrier. But on the other hand, the level of hatred towards cannabis is decreasing every year, and positive changes can already be observed.

For information, technical cannabis is a plant that contains up to 0.2% of the narcotic substance tetrahydrocannabinol. The variety planted in the Khovos district was brought

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from Europe, that is, from France, and it contains a very small amount of narcotics. It does not have any narcotic effect on the living organism. Therefore, the substances contained in the technical cannabis plant grown in Uzbekistan do not have a negative effect on the human body at all. In Uzbekistan, it was allowed to grow the technical cannabis plant containing up to 0.2% tetrahydrocannabinol drug for industrial purposes. In particular, this indicator is up to 0.3% in China and the Czech Republic, up to 0.2% in Italy, Hungary, Sweden, Belgium, and up to 0.1% in the Russian Federation. Technical cannabis is economically and ecologically a plant suitable for the climate of Uzbekistan and has its own characteristics.

For example, cannabis is one of the fastest growing crops, compared to cotton, 4 times more cellulose is obtained from 1 hectare, less agricultural chemicals are used per plant, and it requires much less water, protecting the environment. allows cleaning from pollution. It is extremely useful in extracting cadmium and other toxic substances from the soil to restore the lands that have been left out of circulation, in 110 days the plant reaches 2-3 meters and this allows you to get several crops in one season. is being used for its purposes.

The amount of fees to be paid for obtaining licenses to engage in certain types of activities related to technical cannabis in Uzbekistan has been approved. 3000 base counts for growing a plant, and 200 base counts for each import, export, processing, storage, sale, purchase, and transportation.

However, in recent years, due to its unique technological properties, new food products have been obtained from the cultivated cannabis plant. A unique feature of cannabis is the accumulation of excellent wood as a biological species. Wood mainly contains cellulose, which determines its elasticity and mechanical strength. It produces paper, cardboard, thermal insulation materials in construction, various fibers, films, plastics, and medicines from cellulose.

High-quality paper is obtained from the cellulose obtained from cannabis. They produce packaging materials using plastic obtained as a result of the polymerization of cannabis cellulose. It is biodegradable and does not pose a threat to the environment [1- 9].

Also, a lot of attention was paid to the cannabis plant as a renewable source of cellulose production abroad. In the last decade, effective work was carried out in scientific research centers and environmentally friendly technologies were introduced from the cannabis plant. Using cannabis cellulose, some developed countries have significantly reduced deforestation and ensured environmental protection [10; pp. 46-49, 11, 12, 13].

Cannabis is grown today for everyday needs such as food. Medicine, oil, textiles, etc. The center of origin of this plant is China, from where it can be observed that the plant spread to the rest of the world. According to tradition, the cannabis plant is also used in the treatment of various diseases such as asthma Mechoulam et al., Zuardi [14; pp. 61-76, 3; 203-205-b].

The project will be implemented in 2022-2024.

For the cultivation of technical cannabis, which is a new type of plant for the Republic of Uzbekistan, it is important to study from all sides. In the cultivation of this plant, scientific works, achievements, results and reviews of literature carried out by world scientists are deeply studied, on the basis of which the amount of tetrahydrocannabinol narcotic substance (less than 0.2 percent) in the industrial composition of cannabis, productive, disease-resistant We aim to select resistant varieties with high fiber output and oil content in seeds and create new varieties based on them, multiply their seeds and develop agrotechnology of variety cultivation..

2 Materials and methods

Varieties of cannabis plant Rodnik, Felina 32, Ferimon, Fedora 17, Santhica 27, containing tetrahydrocannabinol (less than 0.2 percent)

Laboratory, in vitro, sterilization, field experiment's, statistik.

3 Results and discussion

Determination of seed quality was determined by laboratory fertility, growth energy, growth strength according to GOST 12038-84, weight of 1000 grains was determined according to GOST 12042-80. Fertilization of seeds is one of the main indicators of their arable quality and represents their biological and valuable economic characteristics.

Germination is the ability of seeds to germinate within a specified period of time under favorable conditions that match the crop's requirements. Fertility is determined as a percentage of the number of healthy germinated seeds compared to the number of all seeds taken for germination.

In order to evaluate the quality of planting seeds, their bruising is also taken into account. Germination power is expressed by the number of healthy sprouted seeds in the shortest period determined for each crop.

Comparison of seed germination is shown in percentage. Therefore, it is important to study the fertility of varieties in laboratory conditions before planting.

Germination capacity and level of germination of varieties, one of the quality indicators of seeds was determined before the season of mass sowing in field conditions. The seed contains the biological, morphological and economic characteristics of the plant, therefore, the yield and quality of the crop are closely related to its quality. Seed quality and productivity are studied in seed science, which is a part of plant science. As a result of many researches, the production of new varieties has increased the yield of current crops by 2-5 s/h. The rest of the increase in productivity is due to the use of high-quality planting materials, the planting of seeds of higher generation seed quality not less than 3rd class, an additional yield of 30-32% was ensured.

In the 1996 law of the Republic of Uzbekistan on seed production, the most important quality of seeds is the set of indicators of seed purity, growth potential, germination, growth force, viability, and the degree of non-infestation by pests. indicator represents productivity.

The fact that the location of the seeds in the mother plant is not the same is that they are fed differently, as a result of which their quality is different. Sown seeds are affected by the soil and its temperature, humidity, air, and light. Accents that meet the requirements of the state standard are called conditioned seeds and they are divided into three classes. Seeds that do not meet the requirements of class 3 are called unconditioned seeds and are not recommended for planting. The mass of seeds in a seed batch will not be the same, among them there will be large, medium, small and empty seeds.

The germination capacity of the seeds represents the uniform and rapid germination of the seeds. Vigor of growth is carried out on samples placed to determine seed germination, but germinated plants (vigor) are considered earlier. The growth potential of the seeds is considered as a percentage of empty lawns in the samples taken for analysis. The samples placed in the thermostat are determined in conditions of air humidity of 90-95%. Wheat seeds are grown at a constant temperature of 20C0. In the first calculation, the ability of seeds to grow is determined, and in the second, their fertility is determined. In loosely grown lawns, the roots of the shoots should not be less than the length of the seed, and the roots should have hairs, and the growth (grass, coleoptile) should not be less than half the length of the seed. Seed germination capacity is one of the most important indicators of crop quality.

Table 1. Cultivation qualities of the seeds of the varieties used in the experiment (2022, Khovos district.)

Name of varieties	Weight of 1000 seeds, g	Seed germination capacity, %	Fertility, %		Growth power	
			Laboratory	Field	100 grasses, mass, g	%
Rodnik	15,9	89.7	95.4	84,4	4.3	95
Ferimon 12	16,4	89.9	95.7	84,6	4.7	95
Fedora 17	16,8	89.9	95.8	84,8	4.8	95
Felina 32	17,1	90,1	95.7	85,0	5.1	96
Santicha S27	17,5	90.2	96.1	85,1	5.2	96

In our research, depending on the varieties, the germination capacity of the seeds was 89.2% to 90.2% in the seedlings.

The study of seed fertility, divided into laboratory and field fertility, is accepted and widely used in seed science research. The laboratory fertility of seeds is higher than the field fertility of seeds. This is due to the fact that the seeds are sown deep or on the surface during the germination period in the field, there is too little or too much moisture in the surface layer of the soil, mold fills the cracked areas of the seeds, damage by pests in the soil, etc. will be.

In our experiment, there was no significant difference in the laboratory germination of the seeds between varieties. (Table 1). Laboratory germination of seeds by varieties varied from 95.4% to 96.1%. The highest laboratory viability was found to be 96.1% in the samples using Santicha S27.

According to V.A. Serkov and others, the height of technical cannabis plants in the experimental variant under insufficient moisture conditions was 135-151 cm, and in the control - 146 cm.

The length of the stem of technical cannabis varied from 198 to 212 cm, in the control it was -189 cm. In the variants treated with Floravit preparations (10 ml/l) and (5 ml/l) - +15 cm), it is described as average according to the priority. Character parameters equal to the standard were recorded in the version treated with floravit [13].

Based on the above information, the biometric indicators of technical cannabis in our field experiments conducted in the agrocluster areas of the "Industrial Innovation GROUP" joint enterprise "Cultivation of technical cannabis, processing and production of exportable products" in Khavos district of Syrdarya region are presented in Table 2.

Table 2. Biometric measurement results of technical cannabis varieties (Havos 2022).

The name of the varieties	Plant height, cm.	Number of joints, units.	Root length, cm.	Stem diameter, mm
Ferimon 12	138,4	7	22,4	6,2
Santicha S27	156,7	7	24,8	6,7
Felina 32	133,2	6	20,6	6,4
Fedora 17	127,6	7	18,3	6,9
Rodnik	92,7	5	16,7	5,6
Σ	648,6	32	102,8	31,8
X	129,7	6,4	20,6	6,4

As can be seen from Table 4.4.1, biometric measurements such as plant height, number of joints, root length, stem circumference 90 days after full germination of the plant

Biometric parameters of technical cannabis varieties indicators were analyzed. According to the results of the analysis, the height of the highest plant height was 156.7 cm, the number of joints was 7, the length of the root was 24.8 cm, and the circumference of the stem was 6.7 mm. In the Ferimon variety, these indicators are the length of the stem 138.4 cm, the number of joints is 7, the length of the root is 22.4 cm, the circumference of the stem is 6.2 mm, the height of the plant in the Felina variety is 133.2 cm, the number of joints is 6, the root length is 20.6 cm, the stem circumference is 6.4 mm, and in the Fedora variety, the plant height is 127.6 cm, the number of joints is 7, the root length is 18.3 cm, the stem and the circumference was 6.9 mm. The height of the stem of the Rodnik variety is much lower than that of other varieties, the height of the plant is 92.7 cm, the number of joints is 5, the length of the root is 16.7 cm, and the circumference of the stem is 5.6 mm.

In conclusion, it was observed that the lack of rainfall in Khavos district had a correlative effect on the height of the plant, and the height of the varieties was low, the biometric indicators of the technical cannabis plant, the height of the plant stem, the highest number of joints, root length and stem circumference were reflected in Santicha S27 variety.

Based on modern technology, there are basically two ways to obtain vegetable oils:

- 1. Pressing the oil from the kernel.
- 2. Complete extraction of the residual oil from the oil with a solvent.

Oil content (%) in the seeds of the joint venture "Industrial Innovation GROUP" mejgosudarstvennyy sovet po standartizatsii, metrologii i certificatsiiu GOST ISO 662 - 2019. Jiry i masla jivotnye i rastitelnye opredelenie massovoy doli vlagi i letuchih veshchestv Moskva 20019. According to the method, the amount of oil extracted from the seeds of the varieties was determined in the laboratory.

Table 3. The amount of oil extracted from the seeds of technical cannabis varieties (Havos 2002)

The name of the varieties	the amount of oil in 1 kg of seeds/%	from one hectare of land	
		seed/kg	oil/kg
Ferimon 12	27	672	181
Santicha S27	23	681	156
Felina 32	26	654	170
Fedora 17	25	683	171
Rodnik	24	661	159

Table 3 shows that 1 kg of seeds yielded 24% to 27% oil depending on the variety. The highest oil yield was 27% in the Ferimon 12 variety, the lowest oil yield was 24% in the Rodnik variety. When determining the amount of seed and oil obtained from one hectare, the Santicha S27 variety had 681 kg of seed per hectare, but because of the oil content of 23%, 156 kg of oil was formed per hectare. 181 kg of oil per hectare was obtained due to the fact that the oil content was 27%, despite the amount of 672 kg of seeds per hectare of Ferimon 12 varieties. Based on the results of laboratory and field research, it was found that growing the Ferimon 12 variety for oil from the cannabis varieties is more economical, and it was found that it can serve as the starting material for the varieties created for oil in the selection.

4 Conclusions

For the cultivation of technical cannabis, which is a new type of plant for the Republic of Uzbekistan, it is important to study from all sides. The scientific works, achievements, results and reviews of the literature carried out by world scientists in the cultivation of this

plant were thoroughly studied, based on the fact that the industrial composition of cannabis contains the amount of tetrahydrocannabinol narcotic substance (less than 0.2 percent), productive, disease-resistant In 2022, within the framework of the project "Selection of industrial cannabis varieties suitable for the soil-climatic conditions of the Republic and creation of new varieties based on them" in 2022, in order to select resistant varieties with high fiber output and oil content in seeds and create new varieties based on them, increase their seeds province, Khavos district, an experiment was conducted in the field of "INDUSTRIAL INNOVATION GROUP" LLC, the collections were thoroughly studied and the following conclusions were drawn.

1. In our study, when the quality of seeds was studied in laboratory conditions, there was no significant difference in the laboratory fertility of seeds among varieties. Laboratory germination of seeds by varieties varied from 95.4% to 96.1%. The highest laboratory viability was found to be 96.1% in the samples using Santicha S27. Seed germination varied depending on cultivars and 1000 seed weight. The germination rate of the seeds obtained from the cultivars varied from 4.3 to 5.2 grams per 100 grass mass, the seed germination rate was 95% and 96% according to the grass mass. In the study, it was found that the quality of the seeds (mass of 1000 grains, germination capacity, laboratory fertility, growth strength) was higher in the cuttings used in the cutting of varieties.

2. During the years of our experience, the development phases and duration of the growth period differed between varieties.

Studying the samples of the collection shows that the duration of the plant growth period is an important indicator. Based on the study of the soil and climatic conditions of our experiments, we divided the samples into 3 groups: early (up to 100 days), mid-ripening (up to 100-105 days) and late-ripening (up to 105-120 days) varieties.

As a result of the experiment, the following samples of early, medium and late varieties were separated. The samples of the studied variety were compared to the standard Rodnik (Russia) variety. The growing period of the standard Rodnik variety was 90-95 days. Ferimon 12 (France), Fedora 17 (France), Felina 32 (France), Santicha S27 (France) ripened 5-20 days later than the standard variety, and it was observed that they belonged to the group of medium-ripening and late-ripening varieties. Thus, in the conditions of the Syrdarya region, the growing period of Felina 32 (France), Santicha S27 (France), Rodnik, Ferimon 12 (France), Fedora 17 (France) varieties, based on the early and late ripening of the varieties, when planting on April 10, 95 it was determined to change from 1 day to 115 days.

3. Varieties moderately resistant to septoriosiosis Rodnik (St) Russia, Ferimon 12 (France), Fedora 17 (France), Felina 32 (France), Santicha S27 (France) were found to be resistant. All varieties were susceptible to root rot, while Rodnik (St) Russia, Ferimon 12 (France), Fedora 17 (France) were susceptible, Felina 32 (France), Santicha S27 were resistant to powdery mildew.

According to the results of the experiment, the varieties brought from France are resistant to fungal diseases and the level of damage is 5-20%.

4. Biometric indicators of technical cannabis varieties were analyzed. According to the results of the analysis, the height of the highest plant height was 156.7 cm, the number of joints was 7, the length of the root was 24.8 cm, and the circumference of the stem was 6.7 mm. In the Ferimon variety, these indicators are the length of the stem 138.4 cm, the number of joints is 7, the length of the root is 22.4 cm, the circumference of the stem is 6.2 mm, the height of the plant in the Felina variety is 133.2 cm, the number of joints is 6, the root length is 20.6 cm, the stem circumference is 6.4 mm, and in the Fedora variety, the plant height is 127.6 cm, the number of joints is 7, the root length is 18, 3 cm, and the circumference of the stem was 6.9 mm. The height of the stem of the Rodnik variety is

much lower than that of other varieties, the height of the plant is 92.7 cm, the number of joints is 5, the length of the root is 16.7 cm, and the circumference of the stem is 5.6 mm.

5. From 24% to 27% oil was obtained from 1 kg of seeds depending on the varieties. The highest oil yield was 27% in the Ferimon 12 variety, the lowest oil yield was 24% in the Rodnik variety. When determining the amount of seed and oil obtained from one hectare, the Santicha S27 variety had 681 kg of seed per hectare, but because of the oil content of 23%, 156 kg of oil was formed per hectare. 181 kg of oil per hectare was obtained due to the fact that the oil content was 27%, despite the amount of 672 kg of seeds per hectare of Ferimon 12 varieties. Based on the results of laboratory and field research, it was found that growing the Ferimon 12 variety for oil from the cannabis varieties is more economical, and it was found that it can serve as the starting material for the varieties created for oil in the selection.

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