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COTTON SEED PREPARATION BY ROASTING

Bekboev Khursanali Bahodir ogli
PhD researcher, Department of "Technological Machines and Equipment, Andijan Machine-Building Institute

Abralov Mahmud Abralovich
Doctor of Technical Sciences, Professor of the Department of Equipment and Technology of Welding Production, Tashkent State Technical University

Kosimov Karimjon Zukhriddinovich
Doctor of Technical Sciences DSc, Professor, Head of the Department "Technological Machines and Equipment" Andijan Machine-Building Institute

Abdulkhakimov Shavkatjon Abdullayevich
Senior Lecturer, Department of Technological Machines and Equipment, Andijan Machine-Building Institute

Olimjonov Mamirjon Muhammadjon ogli
Master, Department "Technological Machines and Equipment"
Andijan Machine-Building Institute

ABSTRACT:
This article presents the principle of operation and the results of preparing cotton seeds for sowing by roasting in equipment with a gas flame burner.

Key words: Sowing seeds, processing, oxy-fuel flame, roasting, cotton seeds, fire method, burner, mouthpiece, equipment.

INTRODUCTION:

In the cotton-growing farms of Uzbekistan, the sowing of cotton seeds is carried out with lowered, with fine-fiber prokrov, seeds, with a consumption rate of up to 60 kg/ha, and bare seeds with a consumption rate of 25-37 kg/ha. Bare seeds are obtained as a result of complete cleaning of the fibrous cover from the surface of the seeds. As a result of cleaning, sowing seeds acquire the flowability necessary for precise sowing, which reduces the consumption of seeds by almost two to three times, reduces the cost of their storage, transportation, dressing and thinning seedlings.

Methods for cleaning the fibrous cover of cotton seeds, to a bare state, can be divided into the following groups: physical-mechanical, mechanical, chemical and chemical-mechanical.

Physico-mechanical methods include methods that provide pre-sowing preparation by influencing the physical properties of the fibrous cover of seeds, for example, freezing seeds to a wet surface of a continuously moving belt, as well as surface roasting of cotton seeds. The advantage of these methods is to achieve a reduction in seed descent without significant mechanical damage.

MAIN PART:

Attempts to use surface roasting of cotton seeds began in the 1950s. In 1950 P.A. Kolomiytsev proposed a method for processing cotton seeds by singeing them with hot gases. Installation design M.Yu. Lurie and N.A. Vinogradovaya working on solid fuel (coal,

firewood, peat), was designed for singeing cotton seeds with flue gases at a temperature of 700-1000 ° C for 1-3 seconds. However, a strong decrease in germination (by 20-30%) due to prolonged processing forced the described method to be abandoned.

In the 80s of the last century, for the surface treatment of pubescent cotton seeds in a gas-flame environment, an experimental installation with an annular burner was developed at TsNIIKhprom. However, in this installation, it was not possible to ensure high flowability of seeds while maintaining satisfactory germination due to the large treatment exposure (1-1.5 sec).

The method developed at the Department of Equipment and Technology of Welding Production, TSTU, is carried out by processing the lowered seeds in a jet of oxy-gas flame for 0.2-0.38 seconds. During processing, long fibers burn out, and short ones curl up. At the same time, germination, germination energy, angle of repose, angle of friction and other indicators characterizing the quality of sowing seeds meet the requirements of regulatory and technical documentation. During processing, the seeds fall freely through a vertical chamber, in the lower part of which a propane-butane-oxygen flame burns out, located with mouthpieces opposite each other at an adjustable distance.

However, the use of oxygen as an oxidizing agent requires compliance with more stringent safety measures, increases the cost of seed treatment due to the use of oxygen.

To solve these problems, at the Department of "Machines and Technologies of Welding Production" of the Andijan Machine-Building Institute under the guidance of Professor M.A. Abralov, the method of pre-sowing treatment of cotton seeds was improved, carried out by roasting in a gas-air flame. To create a flame of the required shape and size, a multi-flame injection burner with complete pre-mixing was used.

The use of this method of pre-sowing treatment has the following advantages:

- Reducing the cost of seed treatment, due to the use of atmospheric air as an oxidizing agent compared to the use of an oxy-gas flame;
- Improving the safety of the installation;
- Reducing the consumption of seeds during sowing, due to the increase in flowability compared to lowered seeds;
- Preservation of seeds from rotting under bad weather conditions, due to the presence of a fine-fibered down compared to bare seeds;
- The absence of mechanical damage to seeds compared with mechanical and chemical-mechanical methods of processing.

RESULTS AND DISCUSSION:

Starting from 2020, after the installation was improved, test experiments were carried out on treated seeds for germination and yield in some sown areas of the Andijan region. For example, in 2020, at the test site of the Research Institute of Cotton Growing of Uzbekistan, which is located in the Asaka district of Andijan region, comparative tests of untreated, processed and bare cotton seeds were carried out. The test results showed that the yield of untreated seeds amounted to 37.5 centners, seed treated by fire was 42.5 centners, mechanically treated bare seeds 40.3 centners.

Seeds treated in a multi-flame plant were tested in the laboratory and obtained the following results:

- Germination rate 94%;
- Strength of germination 90%;
- Weight of seeds (1000 pcs.) 115 gr;
- Seed variety An 35.

Also, tests were carried out on the germination of cotton seeds, processed on a multi-flame installation in the fields of Altinkul Elit Seeds LLC. During the study, 100 kg of seeds were sown. Sowing cotton seeds prepared in a

multi-flame apparatus germinated one day earlier than the rest of the seeds due to an increase in the germination energy, and the germination rate was 100%.

In addition to the above data, the method has a number of other advantages, for example, seed residues after seasonal sowing of cotton, they can be used to obtain cottonseed oil. Oil can be extracted more easily and efficiently from these treated seeds in oil refineries (oil yield will increase by 20% more).

Secondly, if cotton seeds are treated in a multi-flame plant, before the chemical denudation process, then the acidity of the treatment solution will be reduced from 30% to 5%, which allows a 25% reduction in the consumption of expensive acids used.

CONCLUSION:

At the moment, by order of the Ministry of Innovation of the Republic of Uzbekistan, the authors of the project have manufactured pilot batches of a plant for multi-flame processing of cotton seeds.

The individual technical characteristics include the following indicators:

- It is possible to adjust the speed of falling seeds through the installation tunnel, which allows you to set the time spent by cotton seeds in the flame;
- Flame power (temperature) can be adjusted from 1100 °C to 2000 °C;
- Depending on the climatic, weather and soil conditions of sowing, it is possible to adjust the thickness of the lowered fibrous cover of seeds;
- It is possible to prepare cotton seeds to improve oil release in the production of cottonseed oil;
- The installation can be used as a dryer for grains of various crops (wheat, corn, sunflower, etc.);
- The Unit is portable, which allows it to be used in the field;
- Installation does not require special skills from service personnel and it is safe to use.

REFERENCES:

1. Хошимов, Х. Х., & Юлдашев, Ш. Х. (2019). Восстановление изношенных колосников при производстве хлопка в хлопчатобумажной промышленности (Doctoral dissertation, Белорусско-Российский университет).
2. Косимов, К. З., Муйдинов, А. Ш., & Хошимов, Х. Х. (2017). ПЕРСПЕКТИВЫ ВОССТАНОВЛЕНИЯ ИЗНОШЕННЫХ ДЕТАЛЕЙ МАШИН НАПЛАВКОЙ КОМПОЗИЦИОННЫХ ПОРОШКОВЫХ МАТЕРИАЛОВ. Вестник Башкирского государственного аграрного университета, (3), 54-59.
3. Bekboyev Xursanali Bahodir o'g'li Urug'lik paxta chigitini tayyorlashdagi yangi usul // Science and Education. 2020. №6. URL: https://cyberleninka.ru/article/n/urug-lik-paxta-chigitini-tayyorlashdagi-yangi-usul (дата обращения: 29.04.2022).
4. Muydinov, A. S., & Abdullayev, S. A. (2021). Calculation Of Resources of Parts of The Type Shaft of Agricultural Equipment. Texas Journal of Multidisciplinary Studies, 3, 62-65.
5. 4Фархшатов, М. Н., Косимов, К., Муйдинов, А. Ш., & Мадазимов, М. Т. (2019). РЕЗУЛЬТАТЫ ИССЛЕДОВАНИЙ ФИЗИКО-МЕХАНИЧЕСКИХ И ЭКСПЛУАТАЦИОННЫХ СВОЙСТВ ЛЕМЕХОВ ПЛУГОВ, ИСПОЛЬЗУЕМЫХ В РЕСПУБЛИКЕ УЗБЕКИСТАН. In СОВРЕМЕННОЕ СОСТОЯНИЕ, ТРАДИЦИИ И ИННОВАЦИОННЫЕ ТЕХНОЛОГИИ В РАЗВИТИИ АПК (pp. 94-97).
6. Фархшатов, М. Н., & Косимов, К. (2018). Пути повышения ресурса рабочих органов почвообрабатывающих машин на примере республики Узбекистан. In Современное состояние, традиции и

инновационные технологии в развитии АПК (pp. 193-196).

7. Косимов, К. З., Муйдинов, А. Ш., Хошимов, Х. Х. (2017). ПЕРСПЕКТИВЫ ВОССТАНОВЛЕНИЯ ИЗНОШЕННЫХ ДЕТАЛЕЙ МАШИН НАПЛАВКОЙ КОМПОЗИЦИОННЫХ ПОРОШКОВЫХ МАТЕРИАЛОВ. Вестник Башкирского государственного аграрного университета, (3), 54-59.
8. Набиев Т. С., угли Махмудов И. Р. ОПРЕДЕЛЕНИЕ ДАВЛЕНИЯ ПРИ ПРЕССОВАНИИ ПОРОШКОВЫХ МАТЕРИАЛОВ //Журнал Технических исследований. – 2020. – Т. 3. – №. 1.
9. угли Махмудов И. Р., Умаров Э. С., Гаппаров К. Г. АНАЛИТИЧЕСКАЯ И МОДЕЛЬНАЯ ОПТИМИЗАЦИЯ КИНЕМАТИЧЕСКИХ СХЕМ РАВНОМЕРНО ПЛОТНОГО ПРЕССОВАНИЯ ПОРОШКОВЫХ МАТЕРИАЛОВ //Журнал Технических исследований. – 2020. – Т. 3. – №. 1.
10. Sotvoldiev A. E., Yusupov S. M., Maxmudov I. R. RESEARCH AND TESTING OF WELDING MODES FOR QUALITY FORMATION OF THE ROOT JOINT //Scientific-technical journal. – 2019. – Т. 2. – №. 4. – С. 138-141.