IRRIGATION AND MELIORATION

Akmalov Sh., Blanpain O., Masson E.
STUDY OF ECOLOGICAL CHANGES IN SYRDARYA PROVINCE BY USING THE REMOTE SENSING AND GEOBIA ANALYSIS METHOD.................................................................4

Akhatov A., Akhmetkanova G.A.
METHOD FOR DETERMINING CLAY MINERALS CONTENT IN SOIL.................................................................8

HYDRAULIC ENGINEERING STRUCTURES AND PUMPING STATIONS

Mirsaidov M.M., Toshmatov E.S., Takhirov S.M.
STUDY OF DYNAMIC BEHAVIOR OF EARTH DAMS CONSIDERING THE DAM BASE........................................12

Yangiev A.A., Gapparov F.A., Adzhimuratov D.S., Kovar P.
FILTRATION STUDY IN THE BODY OF EARTH DAM AND ITS CHEMICAL EFFECT ON PIEZOMETERS.....17

Mirsaidov M.M., Sultanov T.Z., Kisekka Isaya, Yarashov Zh.A., Urazmukhamedova Z.V.
STRENGTH ASSESSMENT OF EARTH STRUCTURES..................................................................................20

Bazarov D.R., Berdiyev M.S., Urazmukhamedova Z.V., Norkulov B.M., Kurbanova U. U., Bestuzheva A.S.
RESULTS OF NUMERICAL RESEARCH OF DISCHARGE CAPACITY OF A SPILLWAY WITH A WIDE THRESHOLD..................................................................................................................24

Sultanov K.S., Loginov P.V., Salikhova Z.R., Takhirov S.M.
STRAIN CHARACTERISTICS OF SOILS AND THE METHODS OF THEIR DETERMINATION......................29

Ikramov N.M., Majidov T.Sh., Khodzinskaya A.G.
EFFECT OF BEDLOAD SEDIMENT NATURAL COMPOSITION ON GEOMETRIC AND DYNAMIC CHARACTERISTICS OF CHANNEL FORMS........................................................................................34

ELECTRIFICATION AND AUTOMATION OF AGRICULTURE AND WATER RESOURCES MANAGEMENT

Radjabov A., Turdiboyev A., Akbarov D., Keshuev S.A.
THE PROBLEMS OF ENERGY EFFICIENCY IN EXTRACTING FAT AND OILS FROM COTTON SEEDS AND THEIR SUFFICIENT SOLUTIONS.................................................................37

ECONOMICS OF WATER MANAGEMENT AND USE OF LAND RESOURCES

Chertovitsky A.S., Narbaev Sh.K., Demidova M.M.
LAND USE SYSTEM MODERNIZATION: ENVIRONMENTAL ASPECT OF MANAGEMENT.........................48
At present, the country's food security is one of the issues raised to the level of public policy in our Republic. For this reason great attention is being paid to the development of this sector.

The average consumption level of vegetable oil in the consumer market of our country today is 0.65 liters per capita, meaning that 218 thousand tons of it should be prepared to use annually. As the average annual growth rate of the population in Uzbekistan is reached to 3%, it determines simultaneous growth of consumption of vegetable oil and demands expanding its trade geography. The strategy of the five main priorities of development of the Republic of Uzbekistan for 2017-2021 is to further strengthen the country's food security, to produce ecologically clean products. In particular, the issues of modernization and re-equipping of cotton and oil-industry enterprises, introduction of modern effective technologies and scientific developments, ensuring the quality of cotton, oil and fat-and-oil products.

The process of extracting oil from the cotton seed has been taking place since ancient times, on the basis of which the mechanical impact of cotton seeds lies. When our ancestors used oil from the seeds and other oil-bearing crops, our fur coals were used. Later on, technical advances in the Earth have led to the improvement of this process.

Today, the extraction of cotton seeds from technical cotton seeds is carried out on technological lines, including the sequential execution of several technological processes fig.1.

The data given in Table 1 show that while at the oil-and-gas production facilities about 297.34kW of electricity is consumed to produce up to 1,000 tonnes of cotton seeds, 65 % of energy is spent to the initial scattering process.

\[ \mu_{sc} = \frac{W_{elec-oil-seed}}{W_{total-oil-seed}} = \frac{297.39}{451.1} = 0.65 \]

More over, cotton oil production technologies are considered as energy-intensive, and for this at present, the existing oil-factories in our country use 1.2*106 kJ to process 1 ton of cotton seeds.

When extracting cotton oil from technical cotton seeds, it is the last and important step to clean, spin, crush and process hydrothermal treatment.

---

**Abstract**

The article deals with the issues of increasing energy efficiency in obtaining oil from cotton seeds. The relationship between the amount of oil obtained and the degree of damage to cotton seed pulp is shown. Electropulse treatment of cotton seeds is expected to increase the amount of oil produced and to reduce energy costs in the technological process.

**Key words:** energy, cotton, electropulse, degree of damage,
Seeds wetting process, unlike the extraction process of other varieties of oil, in regard to this type, cotton seeds are soaked in oil processing plants, but the moisture content of cotton plants and the seeds stored in its critical humidity is low in most cases, the moisture content of the seeds by 6-8% around. As a result, after the removal of moisture, technologically processed seeds delivered to the appropriate state. Humidity of soaked seeds depend on the moisture content in their core moisture. Thus, the humidity will be as follows:

- For 1-3 varieties - 8.5 ... 9.5%
- For 4 varieties - 9.5 ... 10.5%

In this case, optimum moisture is required to squeeze the humidifier seeds, remove the crust from scratch, and tear off the separated core.

For wetting of seeds special VNIIJ humidifier or humidifiers are used. For the sowing of the seeds is used pure water and technological steam mixture.

With the help of VNIIJ humidifier soaking is carried out for 50-60 minutes, moistened with more vapor, but when the total moisture content of the seeds meets the requirements of the technological process at the specified time, the water actually does not reach the inner core layers. Therefore, this type of humidifiers cannot be relied on in production.

For the first time, when the lubricating oil magazine passes between the valves in the five-valve machine, the cell's structure is partially broken; the second is the cell structure, and the partial disruption of the alebral rhinoceros and lipid granules; After a third decay, the cell walls are completely damaged, but the unbroken lipid granules remain in the shell.

The correlation equation using the Chebyshev method is expressed as follows:

\[ r_{(\alpha)} = \sum_{i=1}^{n} \frac{D_{i}^{\alpha}}{D_{i}^{\alpha-1}} \]  

(2)

The error of the equation is ± 0.016 kW.

\[ \sigma = \sqrt{1 - r_{(\alpha)}^2 - \frac{b}{a}} \]  

(3)

The estimated deviation from the real value is ± 0.13%. Based on calculations, the specific energy consumption and power equation required for the crushing of the moon.

\[ P_{g} = 7.5 + 10.93A_{m} - 2.781A_{m}^{2} + 0.286A_{m}^{3} \]  

(4)

\[ d_{m} = 10.93 - 2.781A_{m} + 0.286A_{m}^{2} + 7.5 \]  

(5)

Here is the productivity of the Ам - Squeezing device. The description of the five-valve tool constructed in accordance with (3) and (4) is given in Fig.2.

Analysis of the description indicates that when the productivity is increased from 0 to 3.5-4.0 t/h, the power consumption increases rapidly, more exactly obtaining 2% of each productivity increase. The maximum loading mode for the crushing device is energy-optimistic. However, product degradation should not exceed 85-90 % under defined conditions. The energetic characteristic

### Processed technological processes and energy expenditure on uncovered crude oil

<table>
<thead>
<tr>
<th>№</th>
<th>Technological process</th>
<th>Equipment name</th>
<th>Performance Energy consumption per 1 ton of cotton seeds, KWh</th>
<th>Heat energy for processing 1 tonnes of cotton seeds, Kcal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fertilization and preparation plant</td>
<td></td>
<td>127.3</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Seed Treatrment</td>
<td>USM</td>
<td>140/t/day</td>
<td>23.98</td>
</tr>
<tr>
<td>3.</td>
<td>Moisture</td>
<td>VNIJ</td>
<td>100/t/day</td>
<td>21.22</td>
</tr>
<tr>
<td>4.</td>
<td>Output</td>
<td></td>
<td>120/t/day</td>
<td>49.5</td>
</tr>
<tr>
<td>5.</td>
<td>Separation</td>
<td>P1-MSD</td>
<td>140/t/day</td>
<td>32.6</td>
</tr>
<tr>
<td>6.</td>
<td>2 Seedling slices</td>
<td>BS – 5</td>
<td>100/t/day</td>
<td>33.7</td>
</tr>
<tr>
<td>7.</td>
<td>3 Forpress factory</td>
<td>G – 68</td>
<td>140/t/day</td>
<td>30.3</td>
</tr>
<tr>
<td>8.</td>
<td>Squeezing</td>
<td>FP</td>
<td>100/t/day</td>
<td>93.1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>297.39</td>
<td>35440</td>
</tr>
</tbody>
</table>
of the drill bit shows that the specific power consumption is 35-40 % higher than the minimum.

Based on the data given above, the analysis of power consumption of oil seeds in the existing oil-production enterprises currently is $W_{val.} = 35000-37500 \text{ kWt}$, depending on the efficiency of power consuming devices for the three drilling products.

Currently, almost all oil enterprises use cotton fiber roasting method. By this method, depending on the varieties of the seeds, the melting of the tomato is pre-cooled to 12.0-17.5 % and the temperature is increased to 65-700°C. Then, the moisture can be fired at a temperature of 100-1050°C until 6-7 %. The main purpose of the cooking is to create favorable conditions for the release of raw material from the raw material. As a result of hydrothermal treatment, the properties of proteins, phosphatides, various nitrogen, specific pigment gassipol and its properties change. As a result of moisture and temperature, some toxic gossypol is harmful to the proteins and phosphatides. However, the fattening ability of the grass, which is obtained by the denaturation of proteins at high temperatures, decreases. In addition, other substances (amino acids, lysine, and methionine) are subject to varying degrees of heat and are subject to change. As we know, the specific heat capacity of the product to be heated regardless of how to heat the products (in case of heat treatment) should be considered. If the specific technical load is $C = 1.372 + 0.0069 \cdot t, \text{kJ/(kg·°C)}$ equal to the thermal capacity of the coil, then the average temperature of the trench after the roller is $t=25^\circ \text{C}$ equal to the specific heat capacity of the hammer $C = 1.5445 \text{kJ/(kg·°C)}$. We use the following formula for the heat energy required to heat a kilogram of wheat to a specific temperature.

$$Q = m \cdot c(t_2 - t_1) \text{kJ/kg}$$

Here: $m$ is the product mass, $s$ is the specific thermal capacity, $t_1$ is the initial temperature of the product, $t_2$ is the heating temperature of the product.

If you are cooking from technical seeds at 100-1050 S, you can get 115.83 kW of energy per 1g of product, 115830 kJ for baking 1 ton of product, 35 tonnes per day for processing, and 1 per hour 4054050 kJ of energy consumed during lunch.

In order to accelerate the process of wetting the technical cotton seeds, we recommend that the product be processed electrochemicals. When processing electrochemicals, it allows the seeds to be separated from the oil and fat from the meat. Here, the properties of absorbing, extracting and dehumidifying electrodes are used in the processing of various products. It should be borne in mind that the absorption process is extremely effective when it is close to the globe. Removal of the absorption can be avoided and a controversial process may occur when removed from the tank.

The following factors have been identified for determining the treatment of electrochemicals during the technical pigging process: Radiation Voltage (U), Capacitor Capacity (S), Distance between Rugs, Processing Time.

The product is emulsified by means of the electrochemical bulkhead capacitors. The capacity is 0.1 mkf, the volume is 24 kV and the processing time is 5-6 minutes.

The results obtained from the experiment are shown in Fig.3 in the graphical representation.

The data show that when treated with seeds in water, electrogidirose pellets did not add more water to the controllable seeds, and its drying doubled. However, the moisture content of the processed cotton seeds changes over time, depending on the moisture content of the environment. In oil-plants humidifying prior to sampling, moisture can be treated with primary electrogidiropulsion. Energy expenditures decreased 1.5 times. In condition of electride-porous processing of technical cotton seeds, the consumption of energy in the technological environment depends on the number of impulses.

$$W_e = n \cdot \frac{C \cdot U^2}{2}$$

According to the information, 2,520 kJ of energy is being spent to optimize waste water by treatment with cotton seeds.
One of the first electrophysical effects of electro-pulses is the treatment of technical oils in order to increase the amount of oil in the process of pressing the vegetable oil from vegetable crops. One of the most widely-used technologies today is the primary electropipulous treatment of drying plant products and juicing juices. The difference between electro-pulsed processing and other electrophysical effects is that when electro-pulsed machining of technical seeds occurs suddenly, electrical and mechanical factors affect the product. In this complex, cells are attached to the cells and paraxim cells. As a result, the tissues of the seed cells are distorted uniformly.

The results of primary electro-pulsed processing of cotton seeds are shown in Table 2.

### Table 2

<table>
<thead>
<tr>
<th>Number of impulses, n</th>
<th>Operating Voltage kV</th>
<th>Processed product</th>
<th>Unprocessed control product</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Difficult, kg.</td>
<td>The amount of oil extracted in % of the burst</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>1.59, 27.03</td>
<td>1.57, 27.54</td>
</tr>
<tr>
<td>10</td>
<td>4.5</td>
<td>1.54, 27.22</td>
<td>1.53, 26.86</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>1.53, 28.64</td>
<td>1.57, 27.20</td>
</tr>
<tr>
<td>10</td>
<td>5.5</td>
<td>1.57, 29.80</td>
<td>1.56, 27.64</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>1.60, 30.89</td>
<td>1.58, 26.87</td>
</tr>
<tr>
<td>10</td>
<td>6.5</td>
<td>1.58, 31.56</td>
<td>1.59, 27.62</td>
</tr>
</tbody>
</table>

The existing technology of slimming cotton is 14.6% higher than that of cotton seeds, which means that the rate of electric pulses will increase by 3.5-4%.

As a result of the use of the proposed technology, pressurized oil will be able to squeeze larger amounts of oil in the process of oil production, reduce the duration of frying up to 2 times and reduce the energy consumption of 115.83 kJ to 69.50 kJ per 1 kg of product by lowering the temperature of 65-700 °C 1 tonnes of cotton seeds while saving up to 46330 kJ of energy during the roasting process. Here, 65-700 °C temperature is given to reduce the viscosity of the product. In turn, it will be possible to reduce the amount of fat extracted from the extraction process.

**Conclusion.**

During electro-hydrographic treatment of the technical cotton seeds, it is possible to optimize the seeds for a short period of time, destroy the cell walls of the seeds, which in turn increases the fat content. When the humidifying moisture in the current wetting cells is reached to 6 to 8 hours, the recommended electro technology will reduce the moisture content by 2-3 hours. This, in turn, saves the excessive consumption of enzymes.

The amount of fat taken from cotton seeds is 14.6%, compared to cotton seed fiber by 35.8%, while the rate of electric pulses increases by 4.5-5%.

By means of electric impulse treatment, the secondary product obtained by reducing the temperature and time of the roasting process in the present technology can preserve the fertility of the ssrot, preventing the loss of the protein in it.

### References: