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# Academia Open



*By Universitas Muhammadiyah Sidoarjo*

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## **Working Conditions of the cotton gin**

### *Kondisi kerja Gin kapas*

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#### **Abstract**

This comprehensive analysis delves into the various stages of cotton cultivation, examining their effects on the health of cotton growers. Through meticulous research, the study investigates the main factors influencing agricultural production and their direct influence on the well-being of workers involved in cotton farming. Furthermore, hygienic measures are developed and discussed as crucial safeguards to protect the health of these workers. The findings underscore the pressing need for proactive measures to address the health risks associated with cotton cultivation, providing valuable insights for policymakers, researchers, and stakeholders seeking to enhance the sustainability and welfare of the global cotton industry.

#### **Highlights:**

- The study focuses on the health implications of cotton cultivation, examining its impact on the well-being of cotton growers.
- Hygienic measures are developed and proposed to safeguard the health of workers engaged in cotton farming.
- The research highlights the importance of proactive interventions to address health risks in the cotton industry, contributing to the sustainability and welfare of cotton growers.

**Keywords:** cotton cultivation, health effects, agricultural production, hygienic measures, worker protection

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## Introduction

It is important to create optimal conditions for jobs in the field of agriculture and it is necessary to monitor their observance. This allows you to maintain the working capacity of workers, also contributes to a noticeable increase in labor productivity at an agricultural enterprise, which affects the economic efficiency of all agricultural production. In recent years, the introduction of high-speed technologies, in agriculture, a similar period of the agro-industrial industry has ended. It has entered the digital zone using new generation technologies and is able to increase the productivity of agriculture in Uzbekistan [1,2].

The technological process of the agro-industrial complex consists of several stages: soil preparation, dressing and sowing seeds, thinning seedlings, cultivation, watering plants, chasing, weed control, pests and diseases, preparation for harvesting, machine and manual harvesting. Sowing is carried out in a square-nest way by special machines - seeders, which are hung on a tractor. . Sowing is preceded by seed dressing. After the emergence of seedlings, the crops are thinned out. During the growing season (May-July) 5-6 times treated between rows (soil loosening). Most of the work is watering the plants. It is carried out during the entire growing season and ends 2-3 weeks before harvest. [3,4].

A significant amount of work in agriculture is the control of weeds, pests and diseases. For this purpose, the chemical method is widely used. In May-August, herbicides, insecticides, acaricides are used, and in September - defoliant and desiccants. The hygienic features that characterize the use of pesticides are mainly the following: the use of a significant range of chemicals, simultaneous use over large areas, a combination of the influence of chemical and meteorological factors (high temperature, solar radiation). Harvesting is the single most labor-intensive process in cotton growing. [5,6].

At all stages of the production process in agriculture, the body of workers is affected by physical (temperature, humidity, solar radiation), chemical (pesticides, mineral fertilizers), biological factors. In addition, agricultural work is characterized by great physical strain. [7,8].

The above data urgently require the development of sanitary and hygienic standards in the field of labor protection and safety of workers of the cotton ginning complex. [9,10].

This issue has become relevant with the release of the Decree of the President of the Republic of Uzbekistan dated February 3, 2021 No. UP -5612. "On the improvement of knowledge and innovation, as well as the provision of modern services in agriculture." [11,12].

The purpose of the study: the purpose of the study was the development of sanitary and hygienic standards in the field of labor protection and safety of workers, the agro-industrial complex and planning the optimization of working conditions

Material and research methods. We have studied the organization of working conditions for workers and engineering and technical services in agriculture and given a hygienic assessment of working conditions for machine operators, waterers, workers caring for crops, and assemblers of engineers. [6,13].

The objects of the study were the farms of the districts of the mahalla committee. The work was carried out jointly with the district center of the State Sanitary Supervision. The study of physical activity was carried out by the method of sanitary hygienic methods and observation. The study was carried out by measuring Physical, chemical, biological factors affecting the body of rural workers. 0324-16), noise and vibration - with a noise meter of the VShV-003 brand (SanPin RUZ0325-16), dust content in the air - by the weight method (guidelines for determining harmful substances in the air), carbon dioxide content - with an ANT-3 gas analyzer (MU012-3 / 0015), determination of residual amounts of pesticides in the air and soil - by thin-layer chromatography (Kyiv - 1985). [3,6].

## Research Results

The leading professions in are machine operators, irrigators, crop care workers, agricultural pickers.

The microclimate at workplaces was largely determined by the climatic conditions of the region, since almost all types of work were performed outdoors. It is characterized by long summers and rather cold winters, large fluctuations in air temperature both during the year and during the day, a significant amount of precipitation, which falls mainly in the winter-spring period.

The first stage of preparation for sowing was seed dressing. For this purpose, on a specially constructed concreted platform, the seeds were treated with the help of Fitovak and P-4. All workers involved in the treatment of seeds underwent a medical examination and were provided with personal protective equipment. [3,6].



During the preparatory season for sowing, the workers were exposed to low and subnormal temperatures (March-April). The air temperature during the day fluctuated from +7 +8C, relative humidity 70-80% and air speed -5-6m/sec. Under these conditions, the heat-shielding properties of clothing and thermal regulation capabilities turned out to be insufficient (according to a survey of 8 workers from each farm).

During the period (at the end of April, beginning of May), the air temperature in the field fluctuated 21-34 C0, and in the cab of the MTZ-80, KhTZ-80 tractor - from 28-36C0. The highest air temperature was observed during the cultivation period and May - June, at 12:00 and 16:00, on average, it turned out to be 36.4-38.6C and periodically reached + 41 + 45C0. The effects of high air temperature during work in the summer season were aggravated by the presence of positive thermal radiation from heated metal parts of tractors. The temperature in the cabin of the KSU-1 mower during this period reached 58-59C0. Relative humidity at workplaces during these works was 50-60%, and the air velocity was 2.5-5m/sec. All processes associated with soil preparation, cultivation and uprooting of stems were accompanied by the formation of a fairly significant amount of dust. When preparing the soil for sowing during harrowing and plowing of land in the breathing zone of tractor drivers, the dust concentration ranged from 16 to 21 mg/m3, which exceeded the permissible norm. During the cultivation period (tractor MTZ-80, KhTZ-80), the concentration of dust in the workplace was 14-17 mg/m3. During autumn plowing with the help of a Magnim tractor and a 4-furrow plow, the dust content of the air in the tractor cabin was 6-9 mg/m3, MTZ-80, T-4, on average 16 mg/m3, with reservations -28 mg/m3.

During manual work in the fields, the concentration of dust in the air of the working area, depending on the distance from the road and the agrotechnical condition of the maps, averaged 3.2-13.4 mg/m3, which corresponds to the data of F.T. Dzhumayev (1987). During the autumn plowing of the soil by tractors and hoes of various brands (MTZ-80, KhTZ-80, T-4) in the breathing zone of tractor drivers, the concentration of carbon monoxide during the period of being on the leeward side was in the range of 8.4-42 mg / m3, when booking 8 .2 -36.1 mg/m3. The development of carbon monoxide poisoning among those working on modern agricultural machines is not observed, however, a number of authors have found that prolonged exposure to relatively low concentrations of carbon monoxide is not harmless. So, according to F.T. Dzhumayeva (1987), the level of carboxyhemoglobin in the blood of cotton growers machine operators before contact with carbon monoxide averaged 2.5%, and at the end of the work, the majority of the examined increased to an average of 7.7%.

The tractors used in the cultivation of the workers were exposed to noise and general vibrations. So, in the cab of the MTZ-80, KhTZ-80 tractor, the noise intensity reached 109-120 dB.

More responsible and time-consuming work is the work of sprinklers. Sprinklers were exposed to the whole complex of climatic factors: low or high temperature, solar radiation, winds, precipitation, low or high humidity. When irrigated in the autumn-winter period, the sprinklers were subjected to a pronounced cooling effect (November - January). The air temperature during these periods of the year ranged from +7 to -9 C0. In the spring period (March), the cooling effects were less pronounced, but at that time the water temperature did not yet exceed -3-6 C0, and the air temperature fluctuated 4-6C0 in the morning and 18-20C0 in the daytime. Significant wind force (up to 16-21m/s) was often noted. In the summer, waterers also worked under unfavorable meteorological conditions, in June-August, even in the early morning hours, the air temperature reached 30 + 35 C0, 12-16 hours - 42 + 48 C0, and at 19-20 hours - 38 + 39 C. High air temperature is combined with low humidity and low air velocity. Workers often watered the soil while being in water at a relatively low temperature (it ranged from 12 to 16 C0 in June and 18-20 C0 in July). At the same time, the head and body of the sprinklers were exposed to high temperatures and insolation. Thus, irrigators have physiological reactions that reflect the impact of multidirectional influences: the head and body of the workers are exposed to intense solar radiation, the effect of high and low temperatures. Water sprinklers often complained of pain in the joints, burning sensation, paresthesia in the limbs, especially at night (21 workers were interviewed). A significant amount of work in cultivation accounted for the fight against weeds, pests and diseases. For this purpose, from May to August, in the fields on sun[1,3].

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