d'ACE (hypochlorite de sodium (teneur en chlore actif 3%) et tensioactifs anioniques 5%) dans une dilution de 110 ml pour 1 litre de solution , suivi de trois rinçages à l'eau stérile.

Lors de la préparation de l'explant, les écailles de couverture et les tissus adjacents au rein sont retirés. Au stade, en fait, de la micropropagation, l'explant est placé verticalement sous un microscope binoculaire sur un milieu nutritif.

Il est prévu d'utiliser comme explants:

- bourgeons apicaux (apicaux) et latéraux (latéraux) des pousses vertes;
- directement le cône de croissance (apex) avec les primordiums foliaires;
- microscopes de 0,5-1 cm de taille.

Pour la culture d'explants in vitro, il est prévu d'utiliser:

Pour la culture d'explants in vitro, on utilise :

1) Un milieu nutritif sans hormones selon la prescription Murasig et Skoog (MS) enrichi des substances suivantes (mg/l) : thiamine (B1), pyridoxine (B6), acide nicotinique (PP) – 0,5 chacun ; inositol – 100; saccharose – 30 000, agar-agar – 7 000;

2) Milieu nutritif selon la prescription de Quorin Lepuavr (QL) enrichi des substances suivantes (mg/l): thiamine (B1), pyridoxine (B6), acide nicotinique (PP) – 0,5 chacun; 6-VAR – 0,1 ; inositol – 100; saccharose – 30 000, agar-agar – 7 000.

Ensuite, une évaluation du potentiel régénératif des microplants sera réalisée en 2 passages (le premier passage 60-80 jours après introduction dans la culture in vitro, 2 passages après 30-40 jours de repiquage des plantes du premier passage).

Au cours du processus de création des passages, la composition du milieu nutritif change. Diverses hormones, formes chélatées de micro-éléments sont ajoutées afin d'identifier la composition optimale du milieu nutritif.

Après un enracinement réussi des porte-greffes et des greffons, des tentatives seront faites pour les combiner in vitro.

La recherche est actuellement à son stade le plus actif. Cependant, les premières données fiables seront obtenues vers la deuxième année de recherche.

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INFLUENCE OF NARROW-BAND LEDs ON TOMATO GROWT AND DEVELOPMENT

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Abstract*: The article investigates the influence of different LED light regimes on growth processes and photosynthetic activity in tomato plants.*

Keywords: *light-emitting diode, photomorphogenesis, plant productivity.*

Agriculture, as you know, is the main link in the agro-industrial complex of the Russian Federation, providing the population with food, and industry with raw materials. Improving the efficiency of agricultural production is possible with its rational functioning, based on the scientific organization of labor, use of scientific and technological progress [1], further improvement of management forms and methods.

Being an important worldwide crop tomato fruits are eaten fresh, boiled, fried, and canned. They are used to make tomato paste, puree, juice, ketchup and other sauces. The largest producers of tomatoes are China, India, the United States, Turkey and Egypt. In Russia, especially in the northern parts of the country, tomatoes are grown mainly in greenhouses under artificial lighting. Hence study of the plant photomorphogenesis mechanisms regulation is extremely important for the development of plant light culture technology [2]. Light is not only the main energy source. It also provides information for regulating the plant development [3].

Light-emitting diode (LEDs) irradiators are a new effective research tool for photobiologists. It becomes possible to study the radiation effect from different ranges of photosynthetically active radiation (FAR) on the productivity and plant biomass quality in a wide irradiances range. This is interesting for practical light culture of crops [4, 5].

The physiological reactions of tomato plants were studied in the Laboratory of Artificial Climate of the RSAU named after K.A. Timiryazev. The plants were grown in different light modes based on narrow-band LEDs.

The study object was tomato plants of the experimental line 1. Tomato of the determinant type, undersized (up to 100 cm) and ultra-ripe (70 days).

The main task of the research work was to study the production process of tomato plants in variants with different ratios of red and blue light in the spectrum, as well as individual red and blue. LEDs with separate red and blue spectra irradiated the plants continuously. LEDs with the ratio of red-blue light were illuminated plants with low-intensity light after the main photoperiod.

In our research, we studied the photomorphogenesis regulation and the plant's production process under light conditions using separate spectra and illumination with the extension of the photoperiod by different light.

Table 1 shows the approximate dates of the beginning of tomato budding, flowering and fruiting. It is noticeable that in the light mode 18h+6 $_{\text{full spectrum}}$ (full-spectrum irradiation with additional illumination), the onset of phases occurred much earlier than with additional illumination by separate spectra and constant irradiation with red or blue light (Table 1). Blue light (24h $_{460}$) significantly slowed flowers and fruits formation in plants compared to the other light modes effects on tomato plants. In addition, blue light prolonged the plants vegetation and inhibited the leaves aging.

Table 1

The onset of the tomato plants phenological phases depending on the irradiation regime (a number of days from germination period)

№	Irradiation mode	Budding	Flowering	Fruit formation
1	18h+6 $_{\text{full spectrum}}$	**24±2**	**30±2**	**44±2**
2	18h+6$_{460}$	25±2	33±2	45±2
3	18h+6$_{640}$	26±2	35±3	46±2
4	18h+6$_{660}$	26±2	36±3	46±2
5	24h $_{460}$	35±3	58±3	66±4
6	24h $_{660}$	28±3	38±3	48±3

Figure 1 shows plant productivity on the 90th day after germination, depending on the spectral composition of optical radiation.

Tomato fruits differ in appearance. At the irradiation modes 1-4, fruit formation is uniform. In the 1st mode, the number of fruits formed was less, but the size was larger, compared to options 2-4. Additional illumination with blue light after the main photoperiod (option 2) contributed to the formation of medium-sized fruits. Additional illumination with red light of 640 and 660nm (variants 3, 4) gave large fruits of a rich red color. It is noticeable that, with continuous irradiation with a separate blue light (option 5) fruits began to ripen much later in comparison with the other modes. Fruit formation at a separate red light (option 6) was also slightly slower, in comparison with the extended photoperiod modes (Figure 1).

Figure 1. Tomato fruits collected from a bush

(Irradiation modes:1) 18 h +6 $_{\text{full spectrum}}$; 2)18h+6$_{460}$; 3)18h+6$_{640}$; 4)18h+6$_{660}$; 5)24h $_{460}$; 6)24h $_{660}$)

Our experiments have shown that the lengthening of the light period by individual spectral ranges of light (full spectrum; blue, red light) with lower intensities can result in an increase in the speed of growth processes, biomass accumulation, and acceleration of the onset of plant phenological phases and tomato productivity rise. Separate spectra (red and blue) contributed to a slower accumulation of green biomass and formation of tomato fruits, in comparison with the variants of the extended photoperiod.

The data obtained provide materials for the physiological justification of the tomato light culture technology in intensive cultivation systems.

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THE EFFECTIVENESS OF USING A PHYTOBIOTIC PREPARATION «FARMATAN» FOR GROWING BROILER CHICKENS

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Abstract: *The zootechnical indicators of broiler chickens growing were studied when replacing feed antibiotics with the phytobiotic «Farmatan».*

Key words: *Phytobiotic, Broiler chickens, Safety, Body weight, Average daily gain, Feed's costs per unit of production .*

Poultry breeding for meat production is very important sector of agriculture, the person's consumption of poultry meat as own production per person in one year is 34 кг [2]. In the period from one day to 6-7 weeks of age, the body weight of broiler chickens increases 50-60 times. Intensive activity of all organs and mechanisms, which regulate the protective functions of the body, is caused by increased of metabolism in broiler's body, which leds to reduce the body's resistance to the effects of even minor environmental factors. This explains the relatively low resistance, as well as susceptibility to diseases that can be caused by pathogenic and opportunistic pathogens [4]. The intensification of modern industrial poultry farming as the most progressive and dynamically developing branch of agriculture, aimed to increasing productivity and increasing production volumes, inevitably leads to numerous