Alle Sorten von x T. cziszinii nach der Getreideernte sind Roggen Snegirevskaya 4,5 t / ha und auch Winterweizen Rubezhnaya 4,2 t / ha unterlegen. Diese Erträge von Trititrigia sind auf zwei Faktoren zurückzuführen. Trititrigia vegetiert und bildet während der gesamten Entwicklungsphase generative Organe. Dies erschwert die Bildung von Körnern in den Hauptähren. Der zweite Faktor ist mit der schlechten Dreschbarkeit von Ähren verbunden, die vom Weizengras geerbt werden. Gleichzeitig kann Trititrigia dank der Fähigkeit, zahlreiche Triebe mit Ähren zu produzieren, auch nach der Ernte von Getreide verwendet werden. N. V. Tsitsin bot mehrere Varianten ihrer Verwendung an. In den südlichen Regionen gibt es zwei Schnitte pro Getreide. In nördlicheren Regionen, mit einem kurzen Sommer, oder drei Schnitte pro grüne Masse oder Ernte pro Getreide und Schnitt pro grüne Masse. Die resultierende grüne Masse oder Heu hat hohe Nährwerte aufgrund der Möglichkeit von Trititrigien, Triebe mit Ähren zu produzieren.

Trotz der Tatsache, dass der Ertrag von Trititrigiakörnern niedriger ist als bei vergleichbaren Kulturen, erfüllt ihre Qualität hohe technologische Standards und sie enthält 15,0-16,1% Protein und 34,7-38,3% Gluten, was um 18-27% höher ist als im Winterweizenkorn.

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LETTUCE PHOTOMORPHOGENESIS UNDER THE LEDS NARROWBAND INFLUENCE IN HYDROPONICS

Tovstyko Darya Andreevna*, a second-year post-graduate student of the Plant Physiology Department, RSAU-MTAA named after K.A. Timiryazev, tov.dasha@mail.ru*

Oberuchenko Alexander Vyacheslavovich, *a second-year master student of the Plant Physiology Department, RSAU-MTAA named after K.A. Timiryazev, yzi1707@gmail.com*

Tarakanov Ivan Germanovich*, DrB, a professor of the Plant Physiology Department RSAU-MTAA named after K.A. Timiryazev, ivatar@yandex.ru*

Fomina Tatiana Nikolaevna*, senior teacher of the Foreign and Russian Languages Department RSAU-MTAA named after K.A. Timiryazev, tfomina67@mail.ru*

Abstract: *The article investigates the influence of different LED light regimes on growth processes and gas exchange in lettuce plants.*

Keywords: *Lettuce, artificial lighting, photomorphogenesis, LEDs*

Research was conducted in the Artificial Climate Laboratory of RSAU-MTAA. Aficion and Carmesi lettuce variety were grown on experimental hydroponics X-bright FitoLED V1.01G. Both varieties were exposed by two spectral complexes [1,2]. The first light ratio was: Red 25%, White 8%, Blue 48%. While the second one was: Red 36%, White 7%, Blue 13%. PPFD was 150 µmol/m^2*s. Mineral wool was used as a substrate [3]. The plants were irrigated every 360 minutes (6 hours), water being provided for 300 seconds. Complex mineral fertilizers were used for nutrient solution preparation.

Lettuce seedlings established on the fourth day. Plants photomorphogenesis oobservations were carried out for 4 weeks under different spectral composition LED light. Lettuce development reaction were analyzed during the vegetation period and gasometry was measured as well (Table 1, 2).

Biometric indicators are represented by the leaves number and leaves area, raw and dry lettuce biomass (Table 1). The most intensive biomass accumulation was observed in the variety Carmesi under both light modes. Practically all Carmesi parameters exceed the Aficion indicators at average of 20% light schedule 1 (Table.1).

Despite the low biomass intensity accumulation by the Aficion variety in comparison with the Carmesi variety, gas exchange rates of the former were the highest in both cases (Table 2). The Aficion photosynthesis intensity under light 1 is about 3 times higher than the same indicator of the Carmesi variety [1, 2, 4].

Table 1

Aficion and Carmesi lettuce growth reaction to different spectral ranges of optical radiation

Experiment option (light ratio in the spectrum, %)	**Number of leaves**		**Raw biomass, g**		**Dry biomass, g**		**Leaf area, cm^2**	
	Aficion	Carmesi	Aficion	Carmesi	Aficion	Carmesi	Aficion	Carmesi
Red/White/Blue= 25/8/48	7,5 ± 0,24	8,5 ± 0,24	6,4 ± 0,8	8,0 ± 1,52	0,7 ± 0,06	0,8 ± 0,17	202,4 ± 16,49	248,9 ± 27,11
Red/White/Blue= 36/7/13	5,7 ± 0,23	8,2 ± 0,23	3,9 ± 0,5	4,3 ± 1,01	0,6 ± 0,02	0,5 ± 0,09	140,5 ± 19,32	172,5 ± 24,28

Table 2

Aficion and Carmesi lettuce gas exchange rates on the spectral composition of optical radiation

Experiment option (light ratio in the spectrum, %)	Photosynthesis intensity, µmol/m²*s		Stomatal conductivity, mol/ m²*s		Transpiration intensity, mol/ m²*s		Respiration intensity, µmol/m²*s	
	Aficion	Carmesi	Aficion	Carmesi	Aficion	Carmesi	Aficion	Carmesi
Red/White/Blue= 25/8/48	2,6 ± 0,33	0,7 ± 0,28	0,16 ± 0,03	0,11 ± 0,03	2 ± 0,36	1,7 ± 0,34	0,4 ± 0,03	0,6 ± 0,08
Red/White/Blue= 36/7/13	1 ± 0,43	0,9 ± 0,26	0,13 ± 0,10	0,05 ± 0,02	1,1 ± 0,62	0,7 ± 0,39	0,7 ± 0,07	0,3 ± 0,09

The rate increase of Blue in the light spectrum contribution to plant biomass accumulation in both plant varieties. But the increase for gas exchange was observed only in the Aficion variety (Table 1,2). On the contrary, the rate increase of Red in the light spectrum inhibits the growth of lettuce. These phenomena may be due to varietal specifity of lettuce [1,2]. It is advisable to continue the research.

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CONTEXTE THEORIQUE DE L'INTENSIFICATION DU NETTOYAGE SUBMERSIBLE PAR VIBRATIONS ULTRASONIQUES

Petrik Dmitri Yourievitch*, doctorant du département de métrologie, de normalisation et de gestion de la qualité, l'Université agraire d'État de Russie –*