Annotation

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Photosynthetic soybean productivity under conditions of application of the herbicide Fabian and plant growth regulator Biolan.

The purpose of our research was to study the effect of "Fabian" herbicide, "Biolan" plant growth regulator on the formation of the photosynthetic productivity of soybean crops, namely: leaf area, net productivity of photosynthesis and content of chlorophyll a and b, as well as carotenoids.

Combined use of "Fabian" with "Biolan" stimulated increasing of the leaf surface area up to 1.0-1.1 thousand m^2/ ha compared with the variants with herbicide using only. The largest leaf surface area was under applying of "Fabian" herbicide - 80 g/ha together with "Biolan", which was 14.6 thousand m^2/ha - in budding phase, 45.8 thousand m^2/ha - in flowering phase and 48.4 thousand m^2/ha – in the phase of beans forming.

Leaf surface area in the phase of beans forming was the highest in all variants of the research. However, use of "Fabian" as herbicide as well as "Biolan" had a positive impact on this index. Herbicide applying together with "Biolan" helped leaf surface of soybean to grow more intensively during all phases of crop development, especially at the beginning of vegetation in comparison with the control variant without herbicide and plant growth regulator use and the variant with applying "Biolan" only.

Accumulation of dry substances was inhibited by competition with weeds in the control variant, so this indicator was within 3.12 g/m^2 per day during the development phase of full corn shoots – tillering; 4.41 g/m^2 per day during the soybean development phase of tillering – flowering; 3.20 g/m^2 per day during the phase of flowering – beans forming. The difference between the variants where "Fabian" herbicide was applied in the norm of 80 g/ha and the control variant was 0.31 respectively; 1.76 and 0.58 g/m^2 per day. Combined use of "Fabian" herbicide in the norm of 80 g/ha with "Biolan" stimulated greater accumulation of dry substances by soybean. The difference between the control variant in accordance with the periods of crop development was 0.45; 1.88 and 0.76 g/m^2 per day, and at a rate of 100 g/ha was 0.38; 1.85 and 0.68 g/m^2 per day.

Positive influence of studies preparations on the content of chlorophyll a and b and carotenoids was determined.

Thus, chlorophyll a in the phase of flowering was higher than in the control variant to 29.2 and 28.1 mg% but the content of chlorophyll b was higher to 8.6 and 8.2 mg% in compliance with the norms of application by using of "Fabian" herbicide. The content of carotenoids was higher than in the control variant to 4.1 and 3.9 mg%. The content of chlorophyll a was higher to 17.8 mg%, chlorophyll b – to 3.6 mg%, the content of carotenoids was 52.0 mg% (which is just 0.5 mg% more than in the control variant) in the variant with hand weeding in comparison with the control variant with no preparations applying.

Thus, "Fabian" herbicide and "Biolan" plant growth regulator while applying together help to lower the level of infestation that influences positively on formation of leaf surface area, accumulation of dry substances during all development phases of soybean and significant increasing of the content of chlorophyll a, b and carotenoids. The highest photosynthetic indexes are formed by combined applying of "Fabian" herbicide in the norm of 80 g/ha together with "Biolan" in the norm of 20 g/ha. Combined application of "Fabian" and "Biolan" gives the opportunity to lower the norm of herbicide to 25% that promotes biologization of soybean cultivation technology.

Keywords: *soybean, herbicide, Fabian, plant growth regulator, Biolan, leaf area, net photosynthetic productivity.*