

# IMPACT HERBICIDE BACKGROUND AND INCREASED TEMPERATURES ON COMPOSITION OF LIPIDS AND ENZYME ACTIVITY

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## **Abstract**

Widespread use of herbicides for soil and agricultural plants in global warming and drought has a negative impact on plant growth and development, which necessitates the study of the effects of these factors on the metabolic processes of cultivated plants in the early stages of their development.

## **Keywords:**

Widespread, agricultural, global , processes.

## **Introduction**

The effect of trophic herbicide (1.25 - 10 mg / l), elevated temperature (+42 ° C; 5, 9, 24 h) and their combined effect on lipid metabolism and enzymes of lipid metabolism of lipase in 6-8-day-old seedlings was studied. medium-early hybrid corn Lyubava 297 MB. Isolation of total lipids was performed according to a modified Bly-Dyer method [1]. Thin layer chromatography of total lipids, their separation into basic fractions with quantitative densitometry of lipid fractions and determination of lipase enzyme activity was performed according to [2]. The component composition of free fatty acids was determined by gas-liquid chromatography on a chromatograph "Chromium - 5" (Czech Republic) when programming the temperature from 150 ° C to 270 ° C according to [3].

In maize grain germination revealed a reduction in total lipids both under the action of trophic herbicide, elevated temperature, and with their complex effect from 12 to 62%, especially significant - at high concentrations of herbicide (10 mg / l) and its combined action with increased temperature (table 1). At later stages,

plants are partially adapted to the action of stress factors and the reduction of total lipids in the germinating grain under the action of the studied stress factors was already - by 12-25%.

Table 1. - The effect of trophic herbicide and elevated temperature on the content of total lipids in the grain of corn hybrid Lyubava 297 MB (7 days of development)

Sample, in processing id	The content of total lipids relative to :	
	weight,%	control,%
Control (H <sub>2</sub> O), +20 ° C	4,0	100
trophy - 1.25 mg / liter	2,5	63
trophy - 2.5 mg / liter	4,0	100
trophy - 5 mg / liter	2,5	63
trophy - 10 mg / liter	3,0	75
control, +42 ° C, 5 years.	2,0	50
trophy - 1.25 mg / l, +42 ° C, 5 hours	2,5	63
trophy - 2.5 mg / l, +42 ° C, 5 hours	2,5	63
tropho 5 mg / l, +42 ° C, 5 years.	2,5	63
trophy 10 mg / l, +42 ° C, 5 h.	2,5	63
control, +42 ° C, 9 years old.	1,5	38
trophy -1.25 mg / l, + 42 ° C, 9 hours	1,5	38
trophy - 2.5 mg / l, +42 ° C, 9 hours	2,0	50
trophy - 5 mg / l, +42 ° C, 9 hours.	3,0	75
trophy - 10 mg / l, + 42 ° C, 9 hours.	2,0	50
control, +42 ° C, 24 years old.	3,5	88
trophy -1.25 mg / l, +42 ° C, 24 hours	3,0	75
trophy - 5 mg / l, +42 ° C, 24 hours.	3,5	88
trophy - 10 mg / l, + 42 ° C, 24 hours.	3,0	75
	3,5	88

Note. The sampling error does not exceed 5% of the average data

The activity of lipase lipid metabolism enzymes was increased (from 20 to 85%), especially with prolonged exposure to temperature and its combined action with the herbicide, which indicated the activation of adaptive processes of lipid metabolism under stress factors. Changes in the fractional composition of total lipids were found, namely, an increase in the majority of polar phospholipids, which are components of biomembranes, both under the action of individual factors and their complex action; and increasing the content of free fatty acids under the influence of the herbicide, but reducing their content under the action of elevated temperature and the combined action of the herbicide and the temperature. An increase in the content of phospholipids may also indicate adaptive changes in the plant organism at both the organismal and membrane levels under the action of a complex of factors. The increase in the level of free fatty acids is the result of activation of adaptive processes in plants, and a decrease in their level may indicate their more intensive inclusion in the processes of lipid peroxidation, which occurs under the complex action of herbicides and temperature. An increase in the ratio of unsaturated and saturated free fatty acids under the action of the herbicide alone, especially at its high concentration (10 mg / l) by 10-13% and the complex action of the herbicide and long-term exposure to high temperatures (1 day) by 12-21%, which testified to the adaptive capabilities of a stable hybrid - to increase the content of unsaturated components of free fatty acids. The effect of separately elevated temperature led to a decrease in this ratio, and hence unsaturated fatty acids, by 9-14%, which testified to the negative impact of elevated temperature on the growth and development of plants in the early stages of grain germination. In general, studies have shown that a simple modified mid-early hybrid Lyubava 297 MB, which is quite stable, in the use of herbicide treatment and warming and increasing the average monthly temperature during ontogenesis reduces its adaptive and protective functions under high doses of herbicide and elevated temperature .

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