



Rationale for the Grip of Fertilizer Application Machines

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Annotation: An analysis of the influence of the working width of MTA for the application of mineral fertilizers on the quality of distribution of ammophos and potassium chloride on the unevenness of the distribution of mineral fertilizers was carried out. As a result of static processing of the results obtained, the regularity of the change in the unevenness index depending on the working width of the unit was established.

Keywords: Mineral fertilizers, centrifugal spreaders, uniformity of application, adjacent passes, working width, moisture, volumetric mass, agrotechnical requirements, dose, ammophos, potassium chloride, rate, variants of experiments, coefficient of variation, standard deviations, variation series, static method, unevenness.

At present, mineral fertilizers are applied mainly by centrifugal spreaders 1RMG-4 and RUM-3. However, their operation in the conditions of agricultural production has shown that the uniformity of fertilizer application set by agrotechnical requirements is not always ensured. One of the reasons for this is the lack of knowledge of the effect of the operating conditions of the machines on the uniformity of the scatter application.

The unevenness of the fertilizer distribution by machines with centrifugal disc working bodies depends significantly on the distance between adjacent passes of the units, i.e. on the working width of the machine.

In the course of the research, the effect of the gripping width of the KSH-4 mineral fertilizer spreader on the quality of distribution of ammophos with a moisture content of 2.35%, a volume weight of 1002.5 kg/m³ and a finely crystalline potassium chloride with a moisture content of 3.1% and a volume weight of 1228 kg/m³ was studied.

In accordance with agrotechnical requirements, the dose of applied ammophos was chosen to be 250 kg/ha. potassium chloride - 100 kg/ha. The working speed of the unit in all variants of the experiments was 2.78 m/s (10 km/h). Wind speed - 1.97 m/s –I The coefficient of variation (V), i.e. the ratio of the standard deviation (G) to the mean dose (q), was used as an indicator of unevenness. Expressed as a percentage:

$$V = \frac{G}{q} 100\%;$$

$$G = \sqrt{\frac{\sum(q_i - q)^2}{n-1}}$$



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q_i - weight of fertilizer on a separate accounting platform (baking sheet) with a size of 0.5 x 0.5; n is the number of accounting sites.

The obtained variation series are processed statistically. The values of the unevenness index $Q_{n.v}$ are given in

Table

Influence of the Working Width of the KSH-4 Machine on the Unevenness of Fertilizer Application

Width Capture	Uneven distribution of fertilizers I at the average application dose). %	
	ammophos - 250 kg/ha potassium chloride - 100 kg/g	
14	58,7	93, 1
13	47,5	88,5
12	38,9	77,4
II	29,2	66, 9
Yu	22, 1	58,4
9	20,7	47,5
8	17,3	36, 0
7	12, b	24, b
6	10,1	14,7

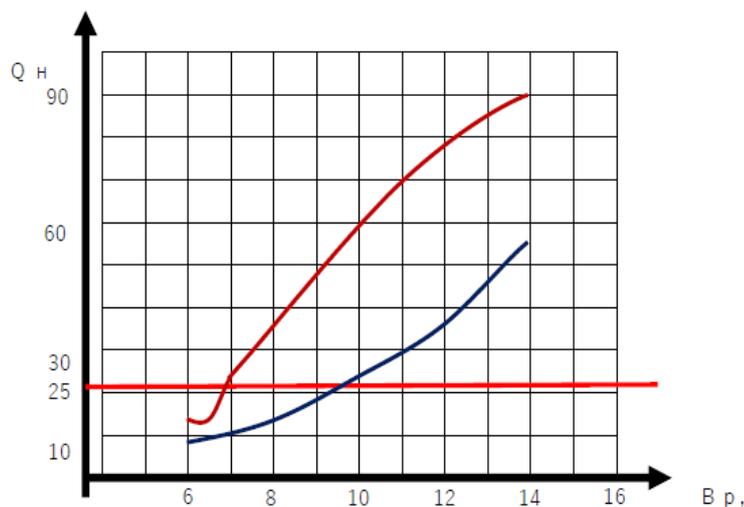


Fig. Changes in the unevenness index Q_n depending on the working width V_r, m when applying



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ammophos (—) and potassium chloride (—) by the KSH-4 spreader Analysis of the results of the studies (Fig.) made it possible to establish that when applying ammophos at a dose of 250 kg/ha and potassium chloride at a dose of 100 kg/ha, agrotechnical requirements for the quality of application are carried out with a working width of 10 m and 7 m, respectively. As the working width of the machine increases, the unevenness $Q n in$ increases. With a working width of 8 m, the unevenness of ammophos application was 17.3%, and at 14 m - 58.7%, with the application of potassium chloride - 36% and 93.1%, respectively.

Inference

The quality of fertilizer application by the KSH-4 machine with a centrifugal disperser depends on the working width of the unit. As the distance between the adjacent passes of the unit increases, the unevenness of the application increases almost in a straight line.

Literature

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