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Nytrogen feeding influence on forming winter rape productivity

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The research results are aimed at the study of nitrogen feeding influence on forming winter rape hybrids productivity in the years of 2012, 2013 and 2014 in the conditions of alkaline and chernozem soil of Rivne district. The research results showed that the yield of studied seeds of winter rape hybrids 3,78 m/ha was at the plots with using fertilizer N30P80K105 + N60 (reestablishment of early spring vegetation) + N30 (flower bud formation) growing Nelson hybrid.

Rape, fertilizers, microelements, feeding, yield, productivity

An important sign of winter tape yield is its structure which consists of the following elements: the plants density on the plot, a number of branches and pods on a plant, an average number of seeds in a pod and the mass of 1, 000 seeds. The highest possible harvest of seeds is formed under their optimal correlation [1]. Fertilizer influence greatly on the mass of 1, 000 seeds. Taking in to account that each element of the structure are formed at different stages of ontogenesis, special conditions are necessary for their development [2, 3]. Thus,seeds form better depending on the level of providing them with nitrogen at phonological phases of growing and developing (rosette forming, stem forming, branching, flower-bud formation) and its strength in vegetative organs.

Objectives and research tasks. The main aim of the research was to find the optimal conditions for feeding in order to increase the productivity of a crop hybrids and to improve the quality of its seeds in specific soil and climate conditions.

The cropping methods for winter rape growing in the field tests is the same for this zone, but for the zone of feeding which were studied in the experiments. The research experiment was done using the method of split plot. On the plots of

the first sequence hybrids were studied, on the second the plants feeding was studied.The crop plot of an ordinary plot is 56 м^2, calculating one is 42 м^2, everything was repeated three times. Winter wheat was grown before it.

The research was done according to the scheme: Factor A was hybrids Nelson, Taurus. Factor B was feeding 1.$N_0P_0K_0$ (control), 2.$N_{120}P_{80}K_{105}$; 3.$N_{90}P_{80}K_{105}$ + N_{30} (the restoring of spring vegetation); 4.$N_{60}P_{80}K_{105}$ + N_{30} (the restoring of early spring vegetation) + N_{30}(flower-bud formation); 5.$N_{30}P_{80}K_{105}$ + N_{60} (restoring of early spring vegetation) + N_{30} (flower-bud formation).

There search out comes. The yield structure signs rather changeable and depet up on the specific conditions which form quantity of each of them. We analyzed the structure of winter rape in order to prove the yield data which are received in different conditions of the experiment. The given data show that using different combinations of fertilizers use structural elements of the crop yield also changed (table 1).

It enables them to form a greater number of branches and later a greater number of pods. Thus, the winter rape feeding area changed in our research under the influence of fertilizers variants and the hybrid from 207,0to 229,3см^2, that was defined by the number of plants on one square meter. In its turn the height of lower branches strength changed from 26,3to37,1 см. Here the number of branches which the plants formed was in average from 5,3 (it was without fertilizing) to 7,4 items (it was using $N_{30}P_{80}K_{105}$ + N_{60} + N_{30}).

During the experiment it was found that the number of pods on plants of hybrid Nelson varied from 113,8 (without vertilizers) to 113,3 items (using $N_{30}P_{80}K_{105}$ + N_{60} + N_{30}), when hybrid Taurus had accordingly from 111,1 to 130,1 items on a plant.

The plants formed the greatest number of seeds in a pod when using $N_{30}P_{80}K_{105}$ + N_{60} + N_{30}. Thus, Hybrid Nelson had in average 22,3 items, and hybrid Taurus had 21,1 items on a plant.

Tablея1

Yield structure of winter rape plants, (average for the period of 2012-2014 years)

Sign	$N_0P_0K_0$(контроль)		$N_{120}P_{80}K_{105}$		$N_{90}P_{80}K_{105}$ + N_{30};		$N_{60}P_{80}K_{105}$ + N_{30} + N_{30}		$N_{30}P_{80}K_{105}$ + N_{60} + N_{30}.	
	Taurus	Nelson	Taurus	Nelson	Taurus	Nelson	Taurus	Nelson	Taurus	Nelson
The number of plants, items per $м^2$	43,6	43,8	45,6	44,8	48,3	44,2	45,7	46,1	48,1	48,9
The feeding area, $см^2$	229,3	227,2	219,3	223,2	207,0	226,2	218,8	216,9	207,9	204,5
The height of lower branches attachment, см	35,3	36,5	26,3	32,5	36,3	31,4	37,1	29,9	36,9	30,1
The number of branches on a plant, items	5,3	5,9	6,3	6,1	6,8	7,1	6,9	7,2	7,1	7,4
The number of pods on a plant, items	111,1	113,8	126,1	123,8	128,2	131,4	129,1	132,5	130,1	133,3
The number of seeds in a pod, items	18,1	18,5	18,6	18,9	20,4	21,6	20,9	22,1	21,1	22,3
The mass of seeds from one plant, gr	8,2	9,3	11,2	10,4	11,8	13,7	12,1	14,1	12,5	14,4
The mass of 1,000 seeds, gr	4,1	4,2	4,8	4,4	4,5	4,8	4,5	4,8	4,5	4,8

The biggest number of 1,000 seeds in our research was received using $N_{30}P_{80}K_{105}$ + N_{60} + $N_{30}$and it was 4,8gr(hybrid Nelson), and it was 4,5gr (hybrid Taurus) and the mass of 1,000 seeds without fertilizers was 4,2 and 4,1g accordingly.

The yield structure influenced directly the crop yield. Thus, the factors which were studied influenced greatly on the yield of winter rape plants.

Table2

The yield of winter rape hybrids, tons per ha
(average for the period of 2012-2014 years)

Fertilizer	Tons per ha	
	Taurus	Nelson
$N_0P_0K_0$(control)	1,26	1,48
$N_{120}P_{80}K_{105}$	2,72	2,81
$N_{90}P_{80}K_{105}$ + N_{30};	3,11	3,29
$N_{60}P_{80}K_{105}$ + N_{30} + N_{30};	3,29	3,51
$N_{30}P_{80}K_{105}$ + N_{60} + N_{30}.	3,66	3,87
HIP_{05}	0,22	0,20

Using $N_{90}P_{80}K_{105}$ + N_{30}та $N_{60}P_{80}K_{105}$ + N_{30} + N_{30} the yield data differed little and were3,11and 3,27tons per ha accordingly (hybrid Taurus) and 3,29 and 3,51tons per ha accordingly (hybrid Nelson).

The highest possible yield of winter rape seeds was received putting$N_{30}P_{80}K_{105}$in the main fertilizer, N_{60} during the spring feeding, N_{30}during the phase of flower- bud forming, that was for hybrid Taurus 3,66tons per ha and for hybrid Nelson 3,87ton per ha.

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