FIELD GERMINATION AND PLANT DENSITY OF PEA PLANTS DEPENDING ON FERTILIZING AND INOCULATION

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Annotation. Recently, interest of producers to legumes in agro-industrial production of Ukraine is growing ever more and more. The receipt of high and stable yields of pea varieties depends on timely passage stages of growth and development, which are defined as varietal peculiarities of the culture, as weather and climatic conditions of the years. Growth and development is one of the most important agrobiological features of agricultural crops, which reflect a certain interaction of plant genotype with a complex of technological receptions and agro-climatic resources of the growing region.

An important factor of yield formation is a plant density per sowing area unit, it affects on crop yields, including peas. Therefore, for development and improvement of technological methods of cultivation that will ensure increasing of individual plant productivity, grain yield and grain quality, it is necessary to establish the patterns of changes in the density of pea seeds.

Experimental part of work was made during 2012-2016 pp. in the stationary experiment of agricultural enterprise "Agronomic Research Station" (Pshenichne village of Vasylkivsky district, Kyiv region) and in the laboratory of analytical research of Plant Growing department of the National University of Life and Environmental Sciences of Ukraine. The soil of experimental site - is a typical low-humus rough-peal-loamy black soil.

To achieve the goal, a field trifactorial experiment was conducted in conditions of Right Bank Forest-Steppe of Ukraine. Factor C: Variety (C_1 - Deviz; C_2 - Tsarevych). Factor D: fertilizing (D_1 - Control (without fertilizers - K_1); D_2 -

$N_{30}P_{60}K_{60}$ (K_2); D_3 - $N_{60}P_{60}K_{60}$; D_4 - $N_{30}P_{90}K_{60}$; D_5 - $N_{90}P_{90}K_{60}$; D_6 - $N_{30}P_{90}K_{90}$). Factor I: seed inoculation (I_1 - No inoculation I_2 - Inoculation). Seeding rate was 1.2 million seeds per hectare.

At the day of sowing, bacteriurization was carried out by a suspension biopreparation risogumin containing a live culture of nodule bacteria *Rhizobium leguminosarum* 31 (the nodule bacteria titre is 2.0 × 109 cells per gram of preparation). Suspensioned biological preparation in the rate 900 g per 1 ton of seeds was diluted in 8-10 liters of water at the day of sowing thoroughly mixed and immediately treated pea seeds with a solution [2, 4].

The maximum number of viable seeds was noted in the variant with introduction $N_{30}P_{60}K_{60}$ in variety Deviz 105 pc/m^2, where seed germination was increased on 20% compare to control variant without seed inoculation and on 15.4% compared with control where seeds was inoculated. In the variant with introduction $N_{30}P_{60}K_{60}$, number of viable seeds was 102 pc / m^2 and increased on 17.2% compare with control (87 pc / m^2) (Fig. 1).

Addition of N_{30} kg / ha did not increase the number of viable seeds, but opposite decreased on about 2-3 units / m^2, depending on seeds inoculation. An additional reduction P_{30} kg / ha reduced the number of viable seeds on 6-8 units / m^2, but for additional addition of K_{30} kg / ha, only 5 units / m^2 depending on seed inoculation.

The largest number of viable seed was noted in the variant with introduction $N_{30}P_{60}K_{60}$ and was 105 pc/m2 in Tsarevych variety, what increased seed germination on 19,3% compare with control variant without seed inoculation and on 14,1% compare with control where seeds was inoculated . In variant with introduction $N_{30}P_{60}K_{60}$, number of viable seeds was 102 pc/m^2 and increased on 15.9% compare with control (88 pc/m^2) (Fig. 2).

The additional introduction N_{30} kg / ha did not increase number of viable seeds, but opposite decrease on about 2 pc / m^2 in variant without seed inoculation. With seed Inoculation number of stairs was at the level of variant $N_{30}P_{60}K_{60}$. An additional applying P_{30} kg / ha reduced number of viable seeds on 2-5 pc/m^2, but,

with additional application K_{30} kg/ha, there was decreasing the number of seedlings on 3-6 pc/m^2 depending on seed inoculation.

At the field conditions all variants, where pre-sowing seed treatment was carried out, field germination of pea seeds was higher compare to the variants without seed treatment. Field germination in control was 91-92% depending on variety. The highest percentage of viable seeds was noted in variety Tsarevych, which varied depending on investigated factors.

In control variant was decreasing of field germination, one of the reasons was extension of BBCH 00-09 period and BBCH 09 stage was marked at 13-16 day depending on variety and fertilizing. The extension of stage BBCH 09 for two days reduced percentage of field germination on 2.0-3.0% for Tsarevych variety and on 5.0-9.0% for Deviz variety with inoculation. In non-inoculated variants, the field germination decreased on 4.0-6.0% for Tsarevych variety and on 5.0-10.0% for variety Deviz, compare with inoculated variants on 7.0-9.0% for variety Tsarevych and 8.0-13.0% for Deviz.

On seed germination have a significant influence hydrothermal conditions of each accounting year separately, which, combined with factors that we studied, played an appropriate role in this indicator formation, and as a result, had influence on productivity of pea plant varieties. In the years of research, the highest percentage of viable seed was noted in variety Tsarevych with introduction $N_{30}P_{60}K_{60}$ and seed inoculation, which was confirmed by further production tests.

Keywords: *peas, sowing, inoculation, fertilizing, variety, technology of growing, field germination*