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The Effect of Compound Fertilizer Rates on The İnitiation of The Essential Growth Stages and Dynamics of Maize in İntercropping

Matanat BahmanliElchin[1*], Rukhsara Israfilova Vidadi[2],Huseynzade Esmira Vahid[3],Mammadova Mina Zaman[4],BabayevaKonul Elchin[5]

[1*]Azerbaijan State Agrarian University, 450, Ataturk avenue, AZ 2000, Gandja, Azerbaijan
e-mail: metanet.abidzade@gmail.ru,Orcid İD:0000-0001-9176-9904
[2]Azerbaijan State Agrarian University, 450, Ataturk avenue, AZ 2000, Gandja, Azerbaijan
e-mail:rukhsare.isafil@mail.ru
[3]Azerbaijan State Agrarian University, 450, Ataturk avenue, AZ 2000, Gandja, Azerbaijan
e-mail:esmira.haciyeva1@gmail.com
[4]Azerbaijan State Agrarian University, 450, Ataturk avenue, AZ 2000, Gandja, Azerbaijan
e-mail:vmns@mail.ru
[5]Azerbaijan State Agrarian University, 450, Ataturk avenue, AZ 2000, Gandja, Azerbaijan
e-mail:rkqbabayeva@rambler.ru
***Corresponding Author :**Matanat Bahmanli Elchin
*e-mail: metanet.abidzade@gmail.ru,

ABSTRACT

This article says that, according to the results of the research, various rates of complex fertilizers had various influence on the initiation of the main development phases and growth dynamics of maize in intercropping.Complex fertilizer rates had a significant impact on the dynamics of maize. The vegetation period was between 96-101 days in the variants with different doses of Diammofos($(NH_4)_2HPO_4$ fertilizer, and between 94-103 days in the variants with different rates of ammofoska. $(NH_4)_2SO_4$+$(NH4)_2HPO_4$ +K_2SO_4. 140 kg per hectare $(NH_4)_2HPO_4$ -Diammophos - in the employedrate higher indicators of main stem were 68.6; 249.5; 316,2 və 336,1 cm ; 160 kg per hectare $(NH_4)_2HPO_4$ -Diammophos - in the applied rate main stem were 70.8; 259.6; 322,2; 346,2 cm. 140 kg of ammophos $(NH_4)_2SO_4$ + $(NH_4)_2HPO_4$ + K_2SO_4 per hectare -in the applied rate higher indicators of main stem were 72.9; 251.3; 331,3 və 354,2 cm; 160 kg of ammophos $(NH_4)_2SO_4$ + $(NH_4)_2HPO_4$ + K_2SO_4 per hectare -in the applied rate main stem were 77.3; 261.2; 348,6 və 365,2 cm. In all cases, the main stem of corn was taller in the variants applied at the rate of 140 and 160 kg of both complex fertilizers per hectare.

Keywords: *Maize, development stages, main stem, nutrients, feed mixtures, complex fertilizers.*

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INTRODUCTION

Intercrops are of decisive importance in creating a fodder base for the developing animal husbandry in our republic.After the harvesting of cereals, it is considered appropriate to cultivate corn, sorghum, soybean, sunflower, rapeseed, peas, beans, sorghum, etc. to prepare green fodder, grain and silage [1]. Many researchers note that more protein is collected in the products of plants grown in intercroppings than in spring and autumn crops, which indicates that the feed is of a higher quality. The conditions for insuring corn crops through the agrarian insurance mechanism implemented with state support in Azerbaijan have been announced.

It should be noted that 14 types of plants and products are insured within the framework of the agricultural insurance mechanism. These are wheat, barley, corn, potatoes, sugar beets, oranges, tangerines, tea, rice, tobacco, grapes, nuts and cotton.

There are two types of insurance for corn crops in Azerbaijan - the grain part of corn (corn grain) and the hull used as animal feed (corn silage).When insuring corn fields, the yield, price of corn, location and selected insurance envelope are taken into account.

According to the rules, the norms of productivity and product prices for 1 hectare of soil have been determined for the calculation. These standards apply to both corn grains and corn silage.

Thus, the yield per hectare is set at 20-200 centners for corn, and the price is set at 40-55 manats / centner.For corn silage, the productivity norm is set at 135-2500 quintals per hectare, and the price is set at 3-5 manat / quintal [4].

It is very relevant and important to select fast-growing plant varieties, develop and apply progressive cultivation technology to harvest twice from the same field in one year. For this purpose, it is important to select agricultural plants with a relatively short vegetation period, which allows for a second harvest, to increase grain production, and to develop technologies that allow to provide the fodder base for livestock [3].

Maize belongs to the cereal family and is used for various purposes. The fact that corn is a valuable plant is that it allows you to solve two problems at the same time - to complete the grain reserves and to get good silage from the stalk. Flour, semolina and canned food (sweet corn) are made from corn grain. In industry, starch, ethyl alcohol, dextrin, sugarare obtained from maize grain. Paper, linoleum, artificial cork and other outputs are acquired from the stalk, leaves and branches of the maize.

Corn grain contains 49-60% oil, 13-20% protein, 1-2% sugar, 1.5-2% ash and 5-6% phytin.Corn is rich in PP, E, D, K, C, B vitamins. Corn oil is the most important food product for the human body.Corn is important in the treatment of atherosclerosis, blood cholesterol reduction and many diseases in humans. Roasted corn is good for weight gain in children. Corn cleanses the body of toxins and other harmful substances, slows down the aging process, strengthens the immune system, and is a very good tool for the prevention of heart and oncological diseases.Corn is rich in B group vitamins and therefore very beneficial for the nervous and gastrointestinal systems. However, corn causes constipation, so you should not eat too much of it. Corn porridge is very good for babies. Corn reduces appetite and therefore can be successfully used during diets aimed at weight loss [8].

In conventional technology, by applying simple technology, unprogrammed, i.e. biological losses are possible products are obtained from any plant.

In intensive technology, the activity of the plant should be strengthened and the biological potential of each variety and hybrid should be ensured. The word intensive comes from the Latin word intensio-tension, and is understood as strengthening the activity of the plant and the person who cultivates it. In intensive technology, there should be no biological loss in productivity due to subjective reasons. In intensive technology, all technological operations are carried out, care is taken of the plant and planting after sowing. This technology is mainly used in the cultivation of grain crops that are sown head-to-head, and partially in the cultivation of inter-row crops [2].

ADAU-80 maize sort purchased from the "Grains and Legumes" Field Laboratory of Azerbaijan State Agricultural University.

MATERIAL AND METHODS

Determining the height of the main stem in a plant.

2-4 leaf phase, germination, broom formation, milk ripening and full ripening stages and determination of main stem height.

Measurements were made from the root neck to the tip of the head shoot (broom) of the main stem. Observations (measurement) will be carried out on 10 pre-marked plants in two replicates (I and III) at each spot during germination, broom formation, milk ripening and full ripening stages.

Effect of complex fertilizer rates on the initiation of development phases in maize.

In the 1st and 3rd replications of each variant, phenological observation is carried out on 10 pre-marked plants in the phases of germination, broom formation, milk ripening and full ripening stages.

RESULTS AND DİSCUSSİONS

Complex fertilizers are fertilizers containing several mineral fertilizers. These fertilizers are mainly nitrogen, phosphorus and potassium fertilizers.When the soil lacks nitrogen, phosphorus and potassium elements, it can be applied complex fertilizers If the soil needs phosphorus, 20:20:0 ($N_{20}P_{20}K_0$) or 18:46:0 complex fertilizer is used at the rate of 30-35 kilograms per hectare before planting or after planting [7, 460 p. pp. 174-177].

One of the most important agrotechnical measures in all areas of crop production is the correct determination of fertilizer rates. Fertilizer rates are determined mainly depending on the biological characteristics of veriety and soil – climatic conditions. With the correct selection of the number of plants per hectare ,an optimal food area for them is created. This increases the productivity of the plant and improves the quailty of the grain. If the optimal fertilizer rate is not created in accordance with number of plants in the field, then other agrotechnical measures are inneffective (6,395 p ;pp 334-337)

According to options vegetation period was 103 103; 101; 98; 101; 104; 102; 96; 98; and 102 days.

In 2022, in the control variant without fertilizer, the germination phase is 01.VIII, stemming is 13.VIII, brooming is 29.VIII, flowering is 11.IX, milk ripening is 05.X, wax ripening is 23.X, and full ripening is 10.XI- also mentioned, the plants completed their vegetation in 103 days.

100 kg per hectare$(NH_4)_2HPO_4$ -Diammophos - in the applied variant,germination was recorded on 01.VIII, stemming phase was recorded on 11.VIII, brooming on 30.VIII, floweringwere recorded on10.IX milk, wax and full ripeningwere recorded 04.X, 20.X, 08 XI, respectively, vegetation period 99 was equal to the day.

120 kg per hectare$(NH_4)_2HPO_4$ -Diammophos- in the applied variant,germination was recorded on 01.VIII, stemming phase was recorded on 11.VIII, brooming on 30.VIII, flowering were recorded on10.IX milk, wax and full ripening were recorded 04.X, 19.X, 05. XI respectively, vegetation period 96 was equal to the day.

140 kg per hectare$(NH_4)_2HPO_4$ -Diammophos - in the applied variant, germination was recorded on 01.VIII, stemming phase was recorded on 11.VIII, brooming on 30.VIII, flowering were recorded on12.IX milk, wax and full ripening were recorded 05.X, 20.X, 08. XI respectively, vegetation period 99 was equal to the day.

160 kg per hectare$(NH_4)_2HPO_4$ -Diammophos - in the applied variant, germination was recorded on 01.VIII, stemming phase was recorded on 13.VIII, brooming on 29.VIII, flowering were recorded on13.IX milk, wax and full ripening were recorded 06.X, 21.X, 12. XI respectively, vegetation period 103 was equal to the day.

100 kg of ammophos $(NH_4)\ 2SO_4$ + $(NH_4)\ 2HPO_4$ + K_2SO_4 per hectare -in the applied variant, germination was recorded on 01.VIII, stemming phase was recorded on 12.VIII, brooming on 30.VIII, flowering were recorded on12.IX milk, wax and full ripening were recorded 06.X, 20.X, 09. XI respectively, vegetation period 100 was equal to the day.

120 kg of ammophos $(NH_4)\ 2SO_4$ + $(NH_4)\ 2HPO_4$ + K_2SO_4 per hectare -in the applied variant, germination was recorded on 01.VIII, stemming phase was recorded on 10.VIII, brooming on 29.VIII, flowering were recorded on10.IX milk, wax and full ripening were recorded 04.X, 19.X, 03. XI respectively, vegetation period 94was equal to the day.

140 kg of ammophos $(NH_4)\ 2SO_4$ + $(NH_4)\ 2HPO_4$ + K_2SO_4 per hectare -in the applied variant, germination was recorded on 01.VIII, stemming phase was recorded on 11.VIII, brooming on 29.VIII, flowering were recorded on11.IX milk, wax and full ripening were recorded 04.X, 20.X, 06. XI respectively, vegetation period 96was equal to the day.

Table 1. Effect of compound fertilizer rateson maize yield

Sort name	Fertilizer rates, kg / ha	Germinationphase	Stemmin gphase	Brooming phase	Flowering of the cob	Milk ripening	Wax ripening	Full ripening	Generalvegetation (day)
"ASAU-80"	Non-fertilizer control	01.VIII	13.VIII	29.VIII	11.IX	05.X	23.X	10.XI	101
	$(NH_4)_2HPO_4$ Diammofos-100 kg	01.VIII	11.VIII	29.VIII	10.IX	04.X	20.X	08.XI	99
	$(NH_4)_2HPO_4$ Diammofos -120 kg	01.VIII	11.VIII	30.VIII	10.IX	04.X	19.X	05.XI	96
	$(NH_4)_2HPO_4$ Diammofos -140	01.VIII	11.VIII	30.VIII	12.IX	05.X	20.X	08.XI	99
	$(NH_4)_2HPO_4$ Diammofos -160	01.VIII	13.VIII	29.VIII	13.IX	06.X	21.X	12.XI	103
	$(NH_4)_2SO_4$+$(NH4)_2HPO_4$+K_2SO_4 Ammofoska -100 kg	01.VIII	12.VIII	30.VIII	12.IX	06.X	20.X	09.XI	100
	$(NH_4)_2SO_4$+$(NH4)_2HPO_4$+K_2SO_4 . Ammofos -120 kg	01.VIII	10.VIII	29.VIII	10.IX	04.X	19.X	03.XI	94
	$(NH_4)_2SO_4$+$(NH4)_2HPO_4$+K_2SO_4 . Ammofos -140 kg	01.VIII	11.VIII	29.VIII	11.IX	04.X	20.X	06.XI	96
	$(NH_4)_2SO_4$+$(NH4)_2HPO_4$+K_2SO_4 Ammofos -160 kg	01.VIII	12.VIII	29.VIII	12.IX	06.X	21.X	10.XI	101

Table 2. Height of the main stem (cm) depending on the rates of compound fertilizer

The sort name	Fertilizer rates, kg / ha	Height of a plant by phases, (cm)			
		Stemming phase	Brooming phase	Flowering of the cob	Milk ripening
"ASAU-80"	Non-fertilizer control	56,7	211,5	259,6	282,4
	$(NH_4)_2HPO_4$ Diammofos-100 kg	60,2	228,4	300,1	325,6
	$(NH_4)_2HPO_4$ Diammofos -120 kg	64,1	248,7	309,2	333,7
	$(NH_4)_2HPO_4$ Diammofos -140	68,6	249,5	316,2	336,1
	$(NH_4)_2HPO_4$ Diammofos -160	70,8	259,6	322,2	346,2
	$(NH_4)_2SO_4$+$(NH4)_2HPO_4$+K_2SO_4 Ammofoska -100 kg	64,4	235,2	327,4	331,3
	$(NH_4)_2SO_4$+$(NH4)_2HPO_4$+K_2SO_4 - Ammofos -120 kg	69,5	249,6	329,1	348,6
	$(NH_4)_2SO_4$+$(NH4)_2HPO_4$+K_2SO_4 - Ammofos -140 kg	72,9	251,3	331,3	354,2
	$(NH_4)_2SO_4$+$(NH4)_2HPO_4$+K_2SO_4 Ammofos -160 kg	77,3	261,2	348,6	365,2

Picture 1. Observing during the stemming phase.

CONCLUSİON

1. 140 kg per hectare$(NH_4)_2HPO_4$ -Diammophos - in the applied variant, germination was recorded on 01.VIII, stemming phase was recorded on 11.VIII, brooming on 30.VIII, flowering were recorded on12.IX milk, wax and full ripening were recorded 05.X, 20.X, 08. XI respectively, vegetation period 99 was equal to the day.**140 kg of ammophos (NH_4) $2SO_4$ + (NH_4) $2HPO_4$ + K_2SO_4 per hectare -in the applied variant**, germination was recorded on 01.VIII, stemming phase was recorded on 11.VIII, brooming on 29.VIII, flowering were recorded on11.IX milk, wax and full ripening were recorded 04.X, 20.X, 06. XI respectively, vegetation period 96 was equal to the day. The indicators were higher in the development phases in the variants applied at the rate of 140 kg per hectare in both forms of fertilizer.

2. 140 kg per hectare$(NH_4)_2HPO_4$ -Diammophos - in the applied rate higher indicators of main stem were 68.6; 249.5; 316,2 və 336,1 cm ; **160 kg per hectare$(NH_4)_2HPO_4$ -Diammophos** - in the applied rate main stem were 70.8; 259.6; 322,2; 346,2 cm. **140 kg of ammophos (NH_4) $2SO_4$ + (NH_4) $2HPO_4$ + K_2SO_4 per hectare -in the applied rate**higher indicators of main stem were 72.9; 251.3; 331,3 və 354,2 cm;**160 kg of ammophos (NH_4) $2SO_4$ + (NH_4) $2HPO_4$ + K_2SO_4 per hectare -in the applied rate** main stem were 77.3; 261.2; 348,6 və 365,2 cm.

In all cases, the main stem of corn was taller in the variants applied at the rate of 140 and 160 kg of both complex fertilizers per hectare.

REFERENCES

1. Aliyev I.H (2019). "State Program of socio-economic development of the regions of the Republic of Azerbaijan in 2019-2023" Baku.
2. Abdullayeva N.M., Aliyeva A.I., Mammadova S.T. (2017). Studying the methods of cold cultivation of corn seeding of freezing plow raised after various predecessor plants in the dry conditions of Sheki-Zagatala region. Collection of scientific works of Agricultural Research Institute Volume XXXVIII. Baku. pp. 292-295.
3. Allahverdiyev E.R., Hasanova A.O., Aliyeva S.F., (2017). The role of intercropping in efficient use of soil. Proceedings of the republican scientific conference held on the topic of integration and current problems of science in the modern world, December 22-23, Lankaran State University p. 209-210.
4. Bahmanli M.E., Seyidaliyev N.Y. (2020). Technology of corn cultivation in the intercroppings. Technology of maize cultivation in the intercrops. Proceedings of the International Scientific and Practical Conference Global Science and Innovation 2020: Central Kazakhstan. Asia.Nur-Sultan. Page. 58-62.
5. Jumshudov I.M., Shabandayev D.Z., Dunyamaliyev S.A., Abbasov R.A., Mustafayev R.I. (2018). What farmers need to know about farming. Baku p. 208-209.
6. Huseynov M.M., Ibrahimov A.Q., Hasanova A.O. (2015). Basics of Agronomy. Textbook "Araz" publishing house Baku. (395 pages) pp. 334-337.
7. Seyidaliyev N.Y. (2016). Basics of agrochemistry. Textbook. "Vektor" publishing house. Baku, (460 pages) p. 174-177.
8. Seyidaliyev N.Y., Gurbanov F.H., Mammadova M.Z. (2014). Textbook of seed science. Baku (311 pages) p. 136-145.

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