In windless weather, the electronic uninterruptible power supply control system instructs the hydrogen storage system to switch to gas mode, after which hydrogen is fed to fuel cells that produce electricity in the form of direct current 48 V, which is fed to the inverter.

Література:

1. Титко Р., Калініченко В. Відновлювальні джерела енергії (досвід Польщі для України). Варшава. Краків. Полтава: «OWG», 2010. 533 с.

2. Иванчев С.С., Мякин С.В. Полимерные мембраны для топливных элементов: получение, структура, модифицирование, свойства. Успехи химии. 2010. 79, No. 2. С. 117–133.

3. Синяк Ю.В. Перспективы применения водорода в системах децентрализованного электро- и теплоснабжения. Рос. хим. журн. 2008. № 3. С. 41–48.

УДК 811.111

INFLUENCE OF FERTILIZERS ON CORN YIELD
(ВПЛИВ ДОБРИВ НА ВРОЖАЙ КУКУРУДЗИ)

Трегубенко Ю.Г. *– здобувач вищої освіти групи А3/3*

Науковий керівник – Матвєєва А.Л. викладач кафедри іноземних мов МНАУ

Звичайне сільське господарство сильно залежить від використання неорганічних добрив, що забезпечують достатню кількість макроелементів, а деякі залучають довкілля. З іншого боку, органічне сільське господарство, яке використовує лише органічні добрива, вважається екологічно чистим, але іноді не може забезпечити достатні поживні речовини для рослин. Метою цього дослідження було вивчення росту та врожаю кукурудзи, обробленої різною дозою Гранульованого Органічного Добрива (GOF) порівняно з неорганічними добривами.

Ключові слова *- зернисте органічне добриво, неорганічне добриво, кукурудза, ріст, врожай*

Conventional agriculture is heavily depended on the use of inorganic fertilizer that provides sufficient macronutrients, with some draw back on the environment. On the other hand, organic agriculture that only use organic fertilizers is considered environmentally friendly but sometimes could not provide adequate nutrients for plants. The aim of this research was study the growth and

yield of corn treated with different dose of Granular Organic Fertilizer (GOF) in comparison to inorganic fertilizers.

***Key words**: granular organic fertilizer, inorganic fertilizer, corn, growth, yield*

Over the last two decades of the 20th century and the first decade of the 21st century, the average corn yield in the world has increased by 70%. This increase has been the result of constant progress in the breeding and development of increasingly fertile hybrids, application of different types and forms of fertilizers, but also the development of agricultural machines that are used to perform the necessary technological operations [1–3]. Sowing of corn, as a technological phase of production, is one of the most important elements of production technology because it directly affects the achieved yield [4,5]. Shortcomings and irregularities made during sowing can hardly be corrected by other cultural measures, which directly leads to a reduction in yield [6].

In general corn is cultivated conventionally with the intensive application of inorganic fertilizers. The recommended fertilizer dosage for corn are N: 65-95 kg/ha/season, P: 30-50 kg/ha/season, K: 10-30 kg/ha/season [7]. However, some time, farmers use fertilizer under or beyond recommended rates. There is a great concern that over use of inorganic fertilizers, continuously for long period unaccompanied by organic materials has adverse effect to the environment, including degradation of soil quality and pollution. Degraded soil characterized by compacted soil and reduced porosity, decreased soil fertility and content of essential micro nutrients [8]. In addition, soil treated with inorganic fertilizer alone significantly has lower populations of soil microbial biomass, such as bacteria, fungi and actinomycetes, as well as soil enzyme activities [9]. Decreasing soil quality can, cause levelling off crop yield, although farmers use more fertilizer for their crop the yield remain the same or sometimes decrease. In comparison, organic fertilizer poses many advantages including provides a more balance macro and micro nutrients, improves activities of soil microbes, increases P supply by improves mycorrhizae colonization, improves soil structure thus enhance growth of roots, increases Soil Organic Materials [8]. The positive impact of organic fertilizer seen in the short term and long term, which increase soil fertility and crop yields. In the short term, organic fertilizer application can improve the biological and biochemical properties of the soil, so as to produce the similar yield of sweet corn as that treated with inorganic fertilizer [9]. A 32-year study in Sweden showed that the use of organic fertilizers would yield wheat and potatoes approximately the same as those using inorganic fertilizers. Increased yields on land given organic fertilizers were even higher than those given inorganic fertilizers. The quality of wheat and potatoes treated with organic fertilizers is better than those given inorganic fertilizers, in addition to the decrease in weight after storage is lower in wheat and potatoes given

organic fertilizers than those given inorganic fertilizers [9]. Moreover, organic crops contained significantly more vitamin C, iron, magnesium, and phosphorus and significantly less nitrates than conventional crops [7]

Література:

1. Starcevic, L.J.; Latkovic, D. Favorable Year for Record Corn Yields. In 75 Years at the Service of Agriculture (1938–2013); Institute of Field and Vegetable Crops: Novi Sad, Serbia, 2006.

2. Egli, D.B. Comparison of Corn and Soybean Yields in the United States: Historical Trends and Future Prospects. Agron. J. 2008, 100, S79–S88. [CrossRef]

3. Assefa, Y.; Vara-Prasad, P.V.; Carter, P.; Hinds, M.; Bhalla, G.; Schon, R.; Jeschke, M.; Paszkiewicz, S.; Ciampitti, I.A. A New Insight into Corn Yield: Trends from 1987 through 2015. Crop Sci. 2017, 57, 2799–2811. [CrossRef]

4. Elmore, R.; Al-Kaisi, M.; Hanna, M. Corn Seeding Depth: Back to the Basics; University of Maryland Extension: College Park, MD, USA, 2014.

5. Kostic, M.; Rakic, D.; Radomirovic, D.; Savin, L.; Dedovic, N.; Crnojevic, V.; Ljubicic, N. Corn seeding process fault cause analysis based on a theoretical and experimental approach. Comp. Electron. Agric. 2018, 151, 207–218. [CrossRef]

6. Poncet, A.M.; Fulton, J.P.; McDonald, T.P.; Knappenberger, T.; Shaw, J.N.; Bridges, R.W. Effect of Heterogeneous Field Conditions on Corn Seeding Depth Accuracy and Uniformity. Appl. Eng. Agric. 2018, 34, 819–830. [CrossRef]

7. FAO, “Fertilizer use by crop in Indonesia,” Food and Agriculture Organization of the United Nations, Rome, p. 78, 2005.

8. H. Zhang, B. Wang, and M. Xu, “Effects of inorganic fertilizer inputs on grain yields and soil properties in a long-term wheat–corn cropping system in South China,” Communications in Soil Science and Plant Analysis, vol. 39, pp. 1583-1599, May 2008

9. J. A. Adediran, L. B. Taiwo, M. O. Akande, R. A. Sobulo, and O. J. Idowu, “Application of organic and inorganic fertilizer for sustainable maize and cowpea yields in Nigeria,” Journal of Plant Nutrition, vol. 27, pp. 1163-1181, Feb. 2007.