BENEFITS OF LIQUID FERTILIZERS IN AGRICULTURE

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Abstract:*this article describes methods of production and use of liquid fertilizers in agriculture, types of mineral fertilizers, liquid fertilizers and their advantages, possibilities and places of use of phosphorus liquid fertilizers.*

Key words:*liquid fertilizer, nutrient, organic fertilizer, mineral fertilizer, solid fertilizer, complex fertilizer, greenhouse, soil, trace elements.*

The fact that food security can be ensured through the development of agriculture can be understood by looking at the current period of shortage of natural organic fertilizers. The most effective use of mineral fertilizers today depends on the amount of nutrients and elements they contain. That is why the industry is paying more attention to the production of complex fertilizers with different absorbable substances.

There are solid and liquid types of mineral fertilizers according to their aggregate state, and in recent years, the production and use of liquid fertilizers has increased in global practice. Among the developed countries, the largest volume of production of liquid fertilizers was achieved in the USA, England and France. According to experts, in the next 5-10 years, the production and consumption of liquid complex fertilizers in developed countries increased 2-4 times.

The results of statistical studies in the field of production and consumption of liquid fertilizers indicate that their role in agriculture is increasing. This is due to the fact that liquid complex fertilizers has a number of advantages over solid fertilizers. liquid complex fertilizers does not dust, does not stick, it is preferable with free-flowing liquid and unfavorable climatic conditions do not significantly affect their quality indicators.

Production equipment and technology is simple and cheap. In the production of liquid fertilizers, it is convenient compared to solid - powder or granulated (granulated) fertilizers, as it does not require the construction of shops for evaporation, granulation, drying and fractionation of the product, as well as ease of transportation.

In the process of obtaining liquid complex fertilizers, there is no problem of capturing dust and vapors that are constantly released during the granulation process of solid fertilizers. Pumps and pipelines used to transport liquid fertilizers are much cheaper in terms of both capital and operating costs than those used to transport solid fertilizers. By eliminating the simplicity of the production equipment and auxiliary operations (drying, granulation, etc.) from the technological process, high costs are almost halved, as well. Due to the simplicity of the technological scheme and the possibility of full mechanization and automation of the process, the number of maintenance personnel is reduced by 3-4

times. The cost of operations for transportation, storage, application and loading of liquid complex fertilizers is much lower than that of solid fertilizers. In contrast to the processes of obtaining granular fertilizers, high-power aggregates are not required for the production of liquid complex fertilizersto achieve high economic indicators.

It can be effectively used by directly adding micronutrients, herbicides and insecticides to liquid complex fertilizers. When using thermal phosphoric acid, liquid fertilizers with 8-24-0, 10-34-0 and 11-37-0 composition are obtained based on extraction and thermal polyphosphate acids.

If the production of mineral fertilizers in our republic is based on the capabilities of the chemical industry, it will be easy to adapt to the production of liquid phosphorus fertilizers. In addition to the fact that the main part is phosphorus, it is possible to produce a complex N-P-K fertilizer with potassium and nitrogen.

For the first time Nabiev M.N. and others [2-15] developed the technology of obtaining liquid complex fertilizer by decomposing phosphorites with nitric acid and then neutralizing the clarified solution to pH = 1.0 - 1.2. After that, liquid complex fertilizer with pH = 3.0 - 4.5 was obtained by N. Bakhridinov on the basis of extractable phosphoric acid (EFK) obtained from phosphorites of Central Kyzylkum. For this, the thermal concentrate of Central Kyzylkum phosphorite (content: – 25,68%; – 53,28%; – 2,68%; – 1,22%; – 2,76, – 3,58%; – 5,01%) and 93% sulfuric acid was obtained. The stoichiometric rate of sulfuric acid is 70% determined by the amount required for the decomposition of calcium in phosphorite and brought to an aqueous solution of the appropriate concentration.

When it reacts with sulfuric acid - phosphorite - taken for the reaction, the following process is observed:

It is known that calcium dihydro- and hydrophosphates are formed in addition to the main phosphoric acid formed during the acid decomposition of phosphorites.

Most importantly, the low amount of phosphate transferred to the liquid phase during the extraction process is considered unsuitable for quality fertilizer. Therefore, by increasing the obtained EFK from the initial concentration of 21-24% , a liquid fertilizer containing more phosphorus was obtained. Full information about this is given in the author's monograph.

One of the main reasons for the acidification of the resulting liquid fertilizer medium is to reduce their viscosity, and secondly, it reduces the level of sedimentation of the fertilizer. Nowadays, apart from these, the presence of the soils of our republic in an alkaline environment ensures the effectiveness of these fertilizers. Because mineral fertilizers in an acidic environment neutralize them when they are given to an alkaline environment.

One of the possibilities of using this liquid fertilizer in greenhouses is the possibility of reducing their concentration to the desired level. Due to the absence of perob water in greenhouse irrigation systems, the soil in it is different from the soil in the fields. Taking this into account, it is possible to add additional microelements to this liquid fertilizer for

greenhouses by adding zinc, copper, etc. these are considered favorable in the development of crops.

In conclusion, with the launch of production of liquid fertilizers, the possibility of effective use of fertilizers will be created by using them in a concentrated state necessary for greenhouses.

REFERENCES:

1. Бахриддинов, Н. С. (2017). ЖИДКИЕ КОМПЛЕКСНЫЕ УДОБРЕНИЯ НА ОСНОВЕ ЭКСТРАКЦИОННОЙ ФОСФОРНОЙ КИСЛОТЫ. Science Time, (5 (41)), 177-180.

2. Бахриддинов, Н. С., & Тургунов, А. А. (2022). ЭКСТРАКЦИОН ФОСФАТ КИСЛОТА ОЛИШ ДАВРИДА ФИЛЬТРЛАШ ДАРАЖАСИНИ ОШИРИШ. PRINCIPAL ISSUES OF SCIENTIFIC RESEARCH AND MODERN EDUCATION, 1(8).

3. Бахриддинов, Н. С. (2022). ЧИҚИНДИДАН ФОЙДАЛАНИБ МАГНИЙ ВА СУЛЬФАТ ИОНЛИ ОДДИЙ СУПЕРФОСФАТ ОЛИШ ТЕХНОЛОГИЯСИ. PRINCIPAL ISSUES OF SCIENTIFIC RESEARCH AND MODERN EDUCATION, 1(8).

4. Бахриддинов, Н. С., Мамадалиев, Ш. М., &Ёқубжанова, Ё. (2022). ПРАКТИЧЕСКОЕЗНАЧЕНИЕОРГАНИЗАЦИИЭКОЛОГИЧЕСКОГООБРАЗОВАНИЯНИЯВДОШКОЛЬНОМУЧРЕЖДЕНИИ. Oriental renaissance: Innovative, educational, natural and social sciences, 2(5), 443-448.

5. Бахриддинов, Н. С., Мамадалиев, Ш. М., & Джураева, Д. У. (2022). СовременныйМетодЗащитыОзоновогоСлоя. CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES, 3(3), 1-4.

6. Намазов, Ш. С., Бахриддинов, Н. С., Эркаев, А. У., & Абдуллаев, Б. Д. (1991). Физико-химические свойства упаренной экстракционной фосфорной кислоты из фосфоритов Центральных Кызылкумов. Узб. хим. журн, (1), 25-28.

7. Бахриддинов, Н. С. Получения жидких комплексных удобрений на основе экстракционной фосфорной кислоты из фосфоритов Центральных Кызылкумов. Канд диссертация, 1991.

8. Baxriddinov, N., Mamadaliev, S., & Djuraeva, D. (2022). ОЛИЙ ТАЪЛИМ МУАССАСАЛАРИДА ЭКОЛОГИЯДАН ЎҚУВ МАШҒУЛОТЛАРИНИ ТАШКИЛ ЭТИШ. Science and innovation, 1(B8), 10-15.

9. Sadriddinovich, B. N., & Axmadjanovich, T. A. (2021). Role Of Mahalla's Participation In The Development Of Education. International Journal of Progressive Sciences and Technologies, 25(1), 375-378.

10. Sadriddinovich, B. N., & Tukhtamirzaevich, M. A. (2022). DEVELOPMENT OF PRODUCTION OF BUILDING MATERIALS IN THE REPUBLIC OF UZBEKISTAN THROUGH INNOVATIVE ACTIVITIES. Scientific Impulse, 1(4), 213-219.

11. Turgunovna, A. S., Sadriddinovich, B. N., & Mahammadjanovich, S. M. (2021, April). KINETICS OF DECOMPOSITION OF WASHED ROASTED PHOSPHOCONCENTRATE IN HYDROCHLORIC ACID. In E-Conference Globe (pp. 194-197).

12. Bakhriddinov, N. S. (2021). EFFECT OF EXTRACTION PHOSPHORIC ACID EVAPORATION HEAT ON POLYMERIZATION. INFORMATION TECHNOLOGY IN INDUSTRY, 9(3), 842-847.

13.Бахриддинов, Н. С., Эркаев, А. У. Н. Ш., &Абдуллаев, Б. Д. (1991). Аммонизация упаренной ЭФК из фосфоритов Центральных Кызылкумов. Узб. хим. журн, (3С), 3-6.

14. Бахриддинов, Н. С., Эркаев, А. У. Н. Ш., & Абдуллаев, Б. Д. (1991). Экстракционная фосфорная кислота из фосфоритов Центральных Кызылкумов. Узб. хим. журн, (2), 65-67.

15. Бахриддинов, Н. С., Абдуллаев, Б. Д., Эркаев, А. У., & Намазов, Ш. С. (1991). Концентрированная экстракционная фосфорная кислота из фосфоритов Центральных Кызылкумов и ее физико-химические свойства. Узб. хим. журн.-1991, 1, 21-25.

16. Bakhriddinov Nuriddin Sadriddinovich, & Turgunov Avazkhon Akhmadzhanovich. (2022). ADVANTAGE OF SEPARATING THE RESIDUE GENERATED BY THE CONCENTRATION OF THE EXTRACTABLE PHOSPHORIC ACID. Proceedings of International Educators Conference, 3, 461–472.

17.Bakhriddinov Nuriddin Sadriddinovich, Zakirova Dildora Jumanazar qizi EFFICIENT METHOD OF EXTRACTION OF PHOSPHATE ACID FROM LOCAL RAW MATERIALS//INTERNATIONAL SCIENTIFIC-PRACTICAL CONFERENCE ON "MODERN EDUCATION: PROBLEMS AND SOLUTIONS". Parij, 2022. Vol.5, ISSUE 1, Pp. 72-84.

18. Бахриддинов, Н. С. Жидкиекомплекснқеудобрения. Copyrght 2022 Монография. Dodo Bools Indian Ocean Ltd. and Omniscrbtum S

19. Бахриддинов, Н. С. (2005). Ғовасой гилларининг гранулометрик таҳлили натижалари. ФарПИ илмий-техник журнали.–Фарғона.–2005, 1, 52-54.

20. Бахриддинов, Н. С., & Тургунов, А. А. (2020). Марказий Қизилқум фосфориларидан суперфосфат олиш. ФарПИ илмий-техник журнали.–Фарғона.–2020, 2, 228-232.

21. Собиров, М. М., Бахриддинов, Н. С., & Розикова, Д. А. (2020). Термоконцентратни хлорид кислотали парчалаш маҳсулоти ва аммоний нитрат асосида NP-ўғитлар олиш жараёнини тадқиқ қилиш. ФарПИ илмий-техник журнали.–Фарғона.–2020, 2, 222-228.22.

22. Arislanov, A., Abdullaev, M., Mamadaliev, A., Mamadjonov, Z., & Isomiddinov, O. (2022). ПАХТА ҲОСИЛДОРЛИГИНИ ОШИРИШДА УРУҒЛИК ЧИГИТЛАРНИ МИНЕРАЛ ЎҒИТЛАР БИЛАН ҚОБИҚЛАШ ВА ЭЛЕКТРОКИМЁВИЙ ФАОЛЛАШГАН СУВ БИЛАН ИВИТИБ ЭКИШ. Science and innovation, 1(D5), 171-179.

23. Бахриддинов, Н. С., Намазов, Ш. С., &Абдуллаев, Б. Д. (1991). Коррозионные свойства и стабильность жидких комплексных удобрений на основе упаренной ЭФК из Кызылкумских фосфоритов. Деп. в ВИНИТИ, 15, 91.

24.Бахриддинов Н. С., Шарафутдинова Н П. УСТАНОВЛЕНИЕ ИСПОЛЬЗОВАНИЯ ОТХОДНЫХ ГАЗОВ, ОБРАЗУЮЩИХСЯ НА ПРОИЗВОДСТВЕ //Proceedings of International Conference on Modern Science and Scientific Studies. – 2022. – Т. 3. – С. 399-409.

25.Бахриддинов Н. С., Тургунов А.А. КОНЦЕНТРИРОВАНИЯ ЭКСТРАКЦИОННОЙ ФОСФОРНОЙ КИСЛОТЫ ИЗ КЫЗЫЛКУМСКИХ ФОСФОРИТОВ//Proceedings of International Conference on Modern Science and Scientific Studies. – 2022. – Т. 3. – С. 410-419.

26. К Гафуров, ИТ Шамшидинов, А.Арисланов, АТ Мамадалиев.Способ получения экстракционной фосфорной кислоты. SU Patent 5213 U Z. 1998

27.Мамадалиев, А. Т. (2021). Теоретическое обоснование параметров чашеобразного дражирующего барабана. Universum: техническиенауки, (6-1 (87)), 75-78.

28.Rosaboev, A., & Mamadaliyev, A. (2019). Theoretical substantiation of parameters of the cup-shaped coating drums. International Journal of Advanced Research in Science, Engineering and Technology, 6(11), 11779-11783.

29.Мамадалиев, А. Т.,& Мамаджанов, З. Н. (2022). Минерал ўғитлар ва микро-элементли композицияларни сувдаги эритмаси билан қобиқланган тукли чигитларни лаборатория-дала шароитида синаш натижалари.Экономика и социум,(2), 93.

30.Мамадалиев, А. Т. (2022). Уруғлик чигитларни макро ва микроўғитлар билан қобиқловчи қурилманинг ўлчамлари ва иш режимларини асослаш. In МИРОВАЯ НАУКА 2022. ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ РАЗВИТИЯ. МЕЖДУНАРОДНЫЕ КОММУНИКАЦИИ (pp. 54-57)

31.Tuxtamirzayevich, M. A. (2020). Study of pubescent seeds moving in a stream of water and mineral fertilizers. International Journal on Integrated Education, 3(12), 489-493.

32. Tukhtamirzaevich, M. A. (2022, December). DIMENSIONS AND JUSTIFICATION OF OPERATING MODES FOR PANING DEVICE OF HAIRED COTTON SEEDS WITH MACRO AND MICRO FERTILIZERS. In International scientific-practical conference on" Modern education: problems and solutions" (Vol. 1, No. 5).

33. Бахриддинов Н. С., Мамадалиев А. Т. Преимущество отделения осадков, образующихся при концентрировании экстрагируемых фосфорных кислот//Scientific Impulse. – 2022. – Т. 1. – №. 5. – С.

34. Шамшидинов, И. Т., Мамаджанов, З. Н., & Мамадалиев, А. Т. (2014). Изучение коагулирующей способности сульфата алюминия полученного из ангренского каолина. In НАУКА XXI ВЕКА: ТЕОРИЯ, ПРАКТИКА, ПЕРСПЕКТИВЫ (pp. 48-55).

35.Shamshidinov, I. T., Mamadaliev, A. T., & Mamajanov, Z. N. (2014). Optimization of the process of decomposition of aluminosilicate of clays with sulfuric acid. In The First International Conference on Eurasian scientific development (pp. 270-275).

36.Росабоев, А., & Мамадалиев, А. (2013). Предпосевная обработка опушенных семян хлопчатника защитно-питательной оболочкой, состоящей из композиции макро и микроудобрений. Теоритические и практические вопросы развития научной мысли в современной мире: Сборник статей. Уфа Риц БашГУ, 174-176.

37. Мамадалиев, А. Т. (2013). Институт механизации и электрификации сельского хозяйства, г. Янгийул, Республика Узбекистан. Редакционная коллегия, 174.

38.Росабоев, А. Т., & Мамадалиев, А. Т. (2017). Тухтамирзаев ААУ Теоретическое обоснование параметров капсулирующего барабана опушенных семян.Science Time,(5),41

39.Mamadaliyev Adkhamjon Tukhtamirzaevich. (2022). RESULTS OF LABORATORY-FIELD TESTING OF HAIRY SEEDS COATED WITH MINERAL FERTILIZERS. Proceedings of International Educators Conference, 3, 528–536.

40.Mamadaliev, A. (2014). ТУКЛИЧИГИТЛАРНИМИНЕРАЛЎҒИТЛАРБИЛАНҚОБИҚЛОВЧИҚУРИЛМАНИНГКОНУССИ МОНЁЙГИЧИПАРАМЕТРЛАРИНИАСОСЛАШ. Scienceweb academic papers collection.

41.Mamadaliev, A. (2019). THEORETICAL SUBSTANTIATION OF PARAMETERS OF THE CUP-SHAPED COATING DRUMS. Scienceweb academic papers collection.

42.Мамадалиев, А. Т., &Бакиева, Х. А. СУЮҚЎҒИТ-АММИАКАТЛАРОЛИШВАУЛАРНИИШЛАТИШУСУЛЛАРИМамаджановЗокиржонНематжонович. PhD, доцент.

43.Mamadaliev, A. (2002). УРУҒЛИКЧИГИТЛАРНИМАКРОВАМИКРОЎҒИТЛАРКОМПОЗИЦИЯЛАРИБИЛАНҚОБИҚЛАШТЕХНОЛОГИЯСИВАҚУРИЛМАЛАРИ. Scienceweb academic papers collection.

44.Гафуров, К., Росабоев, А., &Мамадалиев, А. (2007). Дражирование опущенных семян хлопчатника с минеральным удобрением. ФарПИилмий-техникжурнали.–Фарғона, (3), 55-59.

45. Mamadaliyev A. T., Bakhriddinov N. S. Teaching the subject of engineering geology on the basis of new pedagogical technology//Scientific Impulse. – 2022. – Т. 1. – №. 5.

46.Tukhtamirzaevich, M. A. (2022, December). DIMENSIONS AND JUSTIFICATION OF OPERATING MODES FOR PANING DEVICE OF HAIRED COTTON SEEDS WITH MACRO AND MICRO FERTILIZERS. In International scientific-practical conference on" Modern education: problems and solutions" (Vol. 1, No. 5).

47.Абдуллаев, М. Т., & Мамадалиев, А. Т. (2022). Изучение эффективности дражирования семян хлопчатника в водном растворе минеральных удобрений и композиции микроэлементов.«. Экономика и социум, (1), 92.

48.Mamadaliev, A. ИШЛО^ ХУЖАЛИК ЭКИНЛАРИ УРУГЛАРИНИНГ ЮЗИНИ ХИМОЯ-ОЗУ^ А^ ОБИГИ БИЛАН^ ОПЛАШ УСУЛИ ВА УНИ АМАЛГА ОШИРИШ УЧУН^ УРИЛМА. Scienceweb academic papers collection.-2003.

49.Mamadaliev, A. (2021). Theoretical study of the movement of macro and micro fertilizers in aqueous solution after the seed falls from the spreader. Scienceweb academic papers collection.

50.Tuxtamirzaevich, M. A. (2021). Presowing Treatment of Pubescent Cotton Seeds with a Protective and Nutritious Shell, Consisting of Mineral Fertilizers in an Aqueous Solution and a Composition of Microelements. Design Engineering, 7046-7052.

51.Mamadaliev, A. (2012). ТУКЛИЧИГИТЛАРНИҚОБИҚЛАШБАРАБАНИНИНГПАРАМЕТРЛАРИНИНАЗАРИЙАСОСЛАШ. Scienceweb academic papers collection.

52. Mamadaliev, A. ТУКЛИЧИГИТЛАРНИ^ ОБЩЛАШБАРАБАНИНИНГПАРАМЕТРЛАРИНИНАЗАРИЙАСОСЛАШ. Scienceweb academic papers collection.-2012.

53.Росабоев, А. Т., Мамадалиев, А. Т., &Тухтамирзаев, А. А. У. (2017). Теоретическоеобоснованиепараметровкапсулирующегобарабанаопушенныхсемян. Science Time, (5 (41)), 246-249.

54.Mamadaliyev, A. T. (2021). son Bakhtiyor Maqsud, Umarov Isroil. Study of the movement of pubescent seed s in the flow of an aqueous solution of mineral fertilizers. A Peer Revieved Open Access International Journal, 10(06), 247-252.

55.Mamadaliev, A. (2003). ҚИШЛОҚХЎЖАЛИКЭКИНЛАРИУРУҒЛАРИНИНГЮЗИНИХИМОЯ-ОЗУҚАҚОБИҒИБИЛАНҚОПЛАШУСУЛИВАУНИАМАЛГАОШИРИШУЧУНҚУРИЛМА. Scienceweb academic papers collection.

56.Mamadaliev, A., Mamadjonov, Z., Arislanov, A., & Isomiddinov, O. (2022). ҚИШЛОҚХЎЖАЛИГИДАУРУҒЛИКЧИГИТЛАРНИАЗОТФОСФОРЛИЎҒИТЛАРБИЛАНҚОБИҚЛАШ. Science and innovation, 1(D5), 180-189.

57.Mamadaliev, A. ТУКЛИЧИГИТЛАРНИМИНЕРАЛУЕИТЛАРБИЛАН^ ОБЩЛОВЧИ^ УРИЛМАНИНГКОНУССИМОНЁЙГИЧИПАРАМЕТР-ЛАРИНИАСОСЛАШ. Scienceweb academic papers collection-2014.

58. Mamadaliyev A. T., Yakubzhanova Ya G. USE OF NEW PEDAGOGICAL TECHNOLOGIES IN TEACHING THE SUBJECTS OF INDUSTRIAL SANITATION AND LABOR HYGIENE //Proceedings of International Conference on Modern Science and Scientific Studies. – 2022. – Т. 3. – С. 378-386.

59.МамадалиевАдхамжонТухтамирзаевич. (2022). ИНЖЕНЕРЛИКГЕОЛОГИЯСИФАНИМАВЗУСИНИЯНГИПЕДАГОГИКТЕХНОЛОГИЯАСОСИДА ЎҚИТИШ. Proceedings of International Educators Conference, 3, 494–504.

60.Парпиев, О.Т. (2011). Использованиепедагогическихигркакфакторповышенияэффективностиобучения. Молодой ученый, (12-2), 127-129.

61.Парпиев О. Т. Использование игровых форм при подготовке студентов к педагогической деятельности //Молодой ученый. – 2020. – №. 24. – С. 424-426.

62.