



THE DEPENDENCE OF THE GROWTH, DEVELOPMENT AND PRODUCTIVITY OF APPLE TREES ON THE FACTORS OF CARE ON LOW-SALINE SOILS OF THE BUKHARA REGION

Rustam Yunusov

Associate Professor, Department of "Soil Science",
Candidate of Agricultural Sciences,
Bukhara State University, Uzbekistan

Feruza Amrilloevna Ganieva

Teacher, Department of "Soil Science",
Bukhara State University, Uzbekistan.

Manzura Isroilovna Artikova

Teacher, Department of "Soil Science",
Bukhara State University, Uzbekistan.

Zamira Alimovna Atayeva

Teacher, Department of "Soil Science",
Bukhara State University, Uzbekistan.

Annotation

In this article, the influence of agrotechnical methods of cultivation in intensive gardens on the growth, development and fruiting of apple trees in the conditions of "Amin-Khat gods" of the Bukhara region is studied. It was revealed that the production of apple fruits increased sharply and the cost of production decreased markedly.

Keywords: intensive apple orchards, variety-rootstock combinations, cultivation methods, zoned varieties, growth, development and fruiting, economic efficiency.

Introduction

In Uzbekistan, including in the Bukhara region, it is planned to dramatically increase the volume and improve the quality of fruit production in existing and newly built gardens in various soil and climatic conditions. In recent years, accelerated (intensive) medium-sized gardens have been created in the country, which, taking into account the age of trees and the priority of fruiting, it is advisable to conduct research.





Today, the requirement of the time is to create intensive gardens for medium and low-growing ones, providing consistently high yields, as well as high quality and more accelerated entry into fruiting. It should be noted that in intensive gardens, the selection of varieties with medium and slow growth, short branch size and high continuous yield, full implementation of agrotechnological measures for their care make it possible to obtain 25-30 tons of high-quality yield per hectare, necessary for the creation of [1,2].

A number of researchers, including F.Ganiyeva [3,4,5,6,7] in order to study the influence of methods and levels of care for medium-sized and slow-growing apple rootstocks in Uzbekistan and abroad, pruning of excess branches on growth, development and further formation of fruiting elements, R.Yunusov [8,9,10] based on the study of the influence of different types of method and degree of pruning on biological properties under different soil and climatic conditions, various scientific data were obtained and, first of all, recommendations were given for creating gardens for each specific condition.

However, it should be noted that studies on this topic, where the biological properties of medium-sized rootstocks of fruit trees have not been fully studied, the ability of branches to dramatically improve fruiting, in which there is an increase in yield and their quality. Rejuvenating and normalizing pruning methods used for cyclic rejuvenation of fruit tree branches for 3-4 years, as well as determining the degree of shortening depending on the condition of the branches, the pruning effect, as well as the specific shape and pruning of branches is the most important agrotechnical technique in increasing the yield and quality of fruits. It should be noted that this event has not been comprehensively and comprehensively studied in certain soil and climatic conditions of Uzbekistan. In particular, during the cultivation of apple trees in the Bukhara region, special attention should be paid to the biological properties of grafted varieties, the year of fruiting of branches, methods of rejuvenation and rationing of pruning, levels of pruning. [11,12,13,14].

Proceeding from the above, it can be said that the Bukhara region, in particular, the horticultural farm "Amin-Khayot Bogi", has studied the most effective methods of cyclic rejuvenation and normalizing pruning of apple varieties under various soil and climatic conditions of the country. The technology of cultivation of apple trees makes it possible to obtain a high yield of fruits in intensive orchards.

To achieve the above goal, the following tasks were performed:

- To study the method and dependence of pruning on rejuvenating and normalizing pruning of fruit tree branches, where it is necessary to determine the effect of pruning on the main phytometric indicators of growth, development and yield;





- Determination of the level of illumination in the crown of trees;
- To study the formation and location of generative organs in the trunk, their impact on the yield and quality of fruits;

Scientific research was carried out in 2015-2019 in the horticultural farm "Amin-Khayot Bogi" of Bukhara district. The climatic conditions of the Bukhara region are sharply continental, with an average annual precipitation of 175-200 mm. Hot sunny days last up to 240 days. The hottest temperature is observed in summer 38.0-45.00 C. Winters are dry and cold. The average relative humidity is 40-60%.

The soil of the Bukhara district, where the horticultural farm "Amin-Khayot Bogi" is located, is an old-irrigated alluvial meadow. The specific gravity of soil pruning in the root layer (70 cm) is 2.84 g/ cm³, which is 21.0% in the meter layer. The amount of humus in the arable soil layer is 0.8-1.4%, the amount of nitrogen is 0.06-0.12%. The total amount of phosphorus is 0.11-0.18% and the amount of potassium is 1.5-3.0% [15,16,17,18].

Object and methodology of research. The object of study are apple varieties that differ from each other by various biological characteristics - the Pervenets Samarkanda, Renet Simirenko and Golden Delicious, grafted on medium-sized rootstocks MM-106. Apple seedlings were planted in 1997 and placed in the garden according to the scheme 6.0x4.0 m. The crown of the trees have a semi-spreading shape. Watered 4-5 times a year at the rate of 700-800 m³ / ha. Watering is carried out by the furrow method.

In the process of rejuvenation of apple branches, the fruiting branches are shortened, leaving 4-8, 8-12 and 12-16 buds to leave the necessary number of fruit buds on the growing branches, and the fruiting ones are shortened for comparison with the control variant. In all studied experimental variants and varieties, the lateral growing branches on the central conducting branches are shortened to a height of 3.0-3.2 m, and with subsequent pruning, this indicator remains at the same height.

The experimental research methods were based on generally accepted methods for apple varieties, calculations and methods developed by the All-Union Scientific Research Institute of Horticulture (1982) to study the phytometric characteristics of apple trees, light and photosynthetic productivity, as well as its quality.

Calculations were carried out to study the parts of the apple tree by varieties - the thickness of the circumference of the stem, the growth of average and total annual branches, the length of branches. At the end of each study period, metric measurements were performed on control trees for calculation. At the same time, the length and thickness of the branches obtained as a result of pruning were measured, and the number of fruiting buds in them was determined.



The studied apple varieties were determined by the method of "shearing" on the surface of the leaves and the accumulation of dry matter on the accounting trees (A. Niginorovich, 1961). The distribution of sunlight along the branches of trees was measured using a Yu-16 luxmeter, i.e. relative to an open area during the period when the leaves have optimal sizes.

The yield of the apple tree was studied on each remaining tree for all calculations, while the average value was calculated for 1 ha. The productivity of the branches was determined in terms of 1m², 1m³ and 1 cm³.

In order to determine the growth and development of the aboveground part of the apple tree in the studied varieties with different biological characteristics. The records were carried out during the research period 2009-2015, where the average and total length of the annual growth of trees were measured.

Experimental Results

The effect of pruning on the upper part of the trunk depends on the degree and method of pruning and the characteristics of the varietal combination, habitat (growth, development and yield), as well as the level of applied agrotechnical care. It is known from the practice of intensive fruit growing that only trees pruned by the method of rejuvenating and normalizing pruning, which annually give high-quality growing and fruiting branches, are able to maintain their productivity for a long time. Trees that lost their ability to grow had a decrease in winter hardiness after several years of harvest, along with the results of their characteristic periodic yield[23,24,25,26].

Over the years of research, the number, weight and growth of pruned branches were determined as a result of pruning techniques that rejuvenate the apple tree based on a 3-4-year cycle, alternating branches formed by combinations of grafted varieties and pruning methods and levels. Also, according to the results of 4-year experiments with an increase in the level of pruning, it was noted that an increase in the number of branches cut from the tree, the mass of buds and branches. Differences in the number, weight and structure of productive branches removed with 3-4-year-old variants of cyclic alternating pruning indicate that varietal combinations of grafted trees depend on the biological properties and the method and degree of pruning. Thus, it was noted that the number of more trimmed fruit branches in the experiment was observed in the varieties Renet Simirenko and Golden Delicious.

The study also found that in the studied apple varieties, when using 3-4-year-old cyclic alternating techniques and the degree of pruning, 4-8 fruit buds were left on the fruit branches, and the most numerous and massive lignified old shoots were removed.





Experimental data show that the shortening of overgrown branches is an effective factor that activates plant growth processes and provides deep physiological changes in the crown of trees. Depending on the method and degree of pruning, the shortening of the apple tree is carried out to varying degrees, i.e. the development of skeletal branches with the growth of branches, as well as changes in other elements of the trunk, thickening of the trunk, thickening of branches, growth of the leaf surface. The thickness of the main trunk of apple trees is one of the main indicators in the conducted agrotechnical experiments.

The ratio of regulation and management of vegetative and reproductive activity of trees is one of the main tasks of agricultural technology, which requires attention to the method and degree of formation and pruning of trees. With the correct placement of trees in the garden, taking into account the biological characteristics of varietal-rootstock combinations, the formation of the crown - when pruning in accordance with the method and level of pruning, their growth and development should be normal, the branches should always have a normal growth of branches, contributing annually to high yields of fruits with good quality[19,20,21,22].

The study data show that the total number of growing branches on the studied varieties in rejuvenation variants with a 3-4-year cycle of pruning branches, the number of fruits decreased by 12-18% compared to the control. It was noticed that this decrease occurred due to pruning of older, yielding branches. The results of the study show that when pruning the left branches, new, younger and more productive branches are formed in their place, contributing to fruiting annually.

According to the results of many years of research, it was found that the leaf surface area of each tree decreased by 18-21.5% with an increase in the norm of the method and degree of pruning, it should be noted that the area of the leaf plate per 1 ha increased markedly.





Table Influence of the method and degree of pruning on the yield of apple trees (2016-2018)

Options for rejuvenating and shaping pruning	Number of buds on the left branches (pcs.)	Yield, t/ha			
		2016 y	2017 y	2018 y	On average for 2016-2018.
Golden Delicious variety					
Pruning with a periodicity of 3 years,	4-8	13.2	14.7	16.8	14.9
	8-12	15.1	16.3	19.3	16.9
	12-16	15.9	17.5	20.5	21.3
	does not shorten	16.5	18.7	21.2	18.8
		14.7	15.9	17.5	16.3
Renet Simirenko variety					
Pruning with a periodicity of 3 years, HCP095 P,%	4-8	12.3	3.2	14.1	11.1
	8-12	14.0	5.1	17.0	12.3
	12-16	14.9	6.0	17.8	12.9
	does not shorten	15.3	7.2	18.5	13.6
		13.0	4.8	15.2	11,0
				2.1	
				4.2	

The data in Table 1 show that intensive apple trees with rejuvenating and normalizing pruning create a favorable environment for the formation of generative organs and ensuring active growth as a result of the method and degree of pruning of branches, which allows you to get high yields annually with good qualities for each year. With such effective pruning and shortening techniques, the length of the branches is 40-60 cm, the average yield is 12.3-18.8 tons / ha.

Conclusion

With an increase in the method and degree of pruning on the branches left to obtain a high yield in the studied apple varieties, i.e. in pruning variants leaving 4-8 to 12-16 fruiting buds, the leaf size decreased by 8-19% compared to the control variant. On the studied varieties Golden Delicious and Renet Simirenko, where rejuvenating and normalizing pruning were applied, the yield increased by 0.6-5.0 t/ha and 0.1-2.6 t/ha.



Used Literature

1. Yunusov, R., Ganieva Fa (2021). Studying The Different Formations Of Apple Trees In Intensive Orchards. Центр Научных Публикаций (Buxdu.Uz), 6(6).
2. Ganieva, F. (2021). Economical Innovative Basis For The Care Of Intensive Stunted Apple Varieties. Центр Научных Публикаций(Buxdu.Uz),6(6). https://Journal.Buxdu.Uz/Index.Php/Journals_Buxdu/Article/View/3375
3. Ганиева, Ф. А., & Юнусов, Р. (2021). Рост И Развития Вегетативно-Размножаемых Подвоев Яблони В Зависимости От Плотности Посадки. Столица Науки". М.
4. Atayeva, Z., Yunusov, R., Nazarova, S., & Ganiyeva, F. (2020). Influence Of Cultivar Combinations And Seedling Thickness On The Formation Of Phytometric Indicators And Productivity Of Pear Trees In Intensive Orchards. Центр Научных Публикаций (Buxdu. Uz), 10(9).
5. Amrilloeyvna, Ganiyeva Feruza, And Yunusov Rustam. "The Growth, Development And Yield Of Apple Trees In Intensive Fruit Orchards Are Hardwood Cutting Combinations And Their Dependence On The Thickness Of Seedlings." Nveo-Natural Volatiles & Essential Oils Journal| Nveo (2021): 9591-9595.
6. Ganieva, Feruza. "Рост И Плодоношение Деревьев Персика В Орошаемых Садах В Зависимости От Конструкции Кроны." Центр Научных Публикаций (Buxdu. Uz) 6.6 (2021).
7. Ganieva, Feruza. "Влияние Засоления Почв На Экологическое Состояние Орошаемых Земель И Физиологические Процессы, Протекающие В Растениях." Центр Научных Публикаций (Buxdu. Uz) 6.6 (2021).
8. Ganiyeva, Feruza. "Кесиш Усули Ва Даражаларининг Олма Дарахти Барг Сатҳига Таъсири." Центр Научных Публикаций (Buxdu. Uz) 6.2 (2020).
9. Ganiyeva, Feruza. "Бухоро Воҳаси Шароитида Олма Дарахтларни Ўсиши, Ривожланиши Ва Ҳосилдорлигининг Кесиш Усуллари Ва Даражаларига Боғлиқлиги." Центр Научных Публикаций (Buxdu. Uz) 6.2 (2020).
10. Ganiyeva, Feruza. "Бухоро Виляти Шароитида Интенсив Боғларда Пакана Мевали Дарахтларни Касаллик Ва Зараркунандалардан Ҳимоя Қилиш." Центр Научных Публикаций (Buxdu. Uz) 6.6 (2021).
11. The Effect Of Cutting (Pruning) Methods And Levels In Intensive Gardens On The Formation Of Apple Trees. Yunusov, R., Ikramova M.L., Ganieva F.A., Shadiyeva S.S. Researchjet Journal Of Analysis And Inventions. Issn: 2776-0960 Volume 3, Issue 1 Jan., 2022. <https://Researchjet.Academiascience.Org>.
12. Yunusov, Rustam. "Studying The Different Formations Of Apple Trees In Intensive Orchards." Центр Научных Публикаций (Buxdu. Uz) 6.6 (2021).





13. Yunusov, Rustam. "Influence Of Cultivar Combinations And Seedling Thickness On The Formation Of Phytometric Indicators And Productivity Of Pear Trees In Intensive Orchards." Центр Научных Публикаций (Buxdu. Uz) 10.9 (2020).
14. Yunusov, Rustam. "The Growth, Development And Yield Of Apple Trees In Intensive Fruit Orchards Are Hardwood Cutting Combinations And Their Dependence On The Thickness Of Seedlings." Центр Научных Публикаций (Buxdu. Uz) 6.6 (2021).
15. Yunusov, Rustam. "Economical Innovative Basis For The Care Of Intensive Stunted Apple Varieties." Центр Научных Публикаций (Buxdu. Uz) 6.6 (2021).
16. Atayeva, Zamira, Et Al. "Influence Of Cultivar Combinations And Seedling Thickness On The Formation Of Phytometric Indicators And Productivity Of Pear Trees In Intensive Orchards." Центр Научных Публикаций (Buxdu. Uz) 10.9 (2020).
17. Yunusov, Rustam. "Влияние Универсальнодействующей Композиционной Суспензии На Урожайность И Качество Зерна В Условиях Бухарской Области." Центр Научных Публикаций (Buxdu. Uz) 5.5 (2021).
18. Yunusov, Rustam. "Int Intensiv Bog'larda Pakana Noklarni Tejamkor Innovatsion Texnologiyalar Asosida Parvarishlash Omillari.: R. Yunusov, Fa Ganieva, Oo Orifov." Центр Научных Публикаций (Buxdu. Uz) 7.7 (2021).
19. Ganieva, Feruza. "Пакана Нок Дарахтларининг Ўсиши, Ривожланиши Ва Ҳосилдорлигининг Кўпайишига Вегетатив Пайвандтаг Ҳамда Интенсив Навларнинг Таъсири." Центр Научных Публикаций (Buxdu. Uz) 6.2 (2020).
20. Yunusov, Rustam. "Intensiv Pakana Nok Bog'lari Tuprog'ining Fizikaviy-Kimyoviy Xossalari Va Rejimining Tasnifi." Центр Научных Публикаций (Buxdu. Uz) 7.7 (2021).
21. The Effect Of Cutting (Pruning) Methods And Levels In Intensive Gardens On The Formation Of Apple Trees. Yunusov, R., Ikramova M.L., Ganieva F.A., Shadiyeva S.S. Researchjet Journal Of Analysis And Inventions. Issn: 2776-0960 Volume 3, Issue 1 Jan., 2022. <https://Researchjet.Academiascience.Org>.
22. Atayeva, Z. (2021). Когон Тумани Саломов Шахобиддин Номидаги Фермер Хўжалиги Қадимдан Суғориладиган Ўтлоқи Тупроқларининг Мелиоратив Ҳолатини Яхшилаш Ва Кузги Буғдой Етиштириш Омиллари. Центр Научных Публикаций (Buxdu. Uz), 7(7).
23. Atayeva, Zamira, Et Al. "Influence Of Cultivar Combinations And Seedling Thickness On The Formation Of Phytometric Indicators And Productivity Of Pear Trees In Intensive Orchards." Центр Научных Публикаций (Buxdu. Uz) 10.9 (2020).





24. Джумаев, Ф. Х., & Атаева, З. А. (2021). Выращивание Растения «*Indigofera Tinctorial*» И Его Роль В Повышении Плодородия Почв В Условиях Бухарской Области. Вестник Науки И Образования, (3-2 (106)), 6-8.
25. Жумаев, Ф. Х., & Атаева, З. А. (2021). Тупроқ Унумдорлигини Оширишда «*Indigofera Tinctoria L.*» Ўсимлигини Аҳамияти. Журнал Агро Процессинг, 3(1).
26. Джумаев, Ф. Х., And З. А. Атаева. "Роль Индигоферы «*Indigofera Tinctoria L.*» В Различных Засоленных Почвах И Его Повышении Плодородия." Инновационное Развитие Бухарской Области: Проблемы И Пути Решения.(31 Января 2020 Г.). Бухара.

