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FRUIT TREE PROPAGATION PRACTICES: WORKSHOPS HELD AT AGROTINS 2025

PRÁTICAS DE PROPAGAÇÃO DE FRUTEIRAS: OFICINAS REALIZADAS NA AGROTINS 2025

PRÁCTICAS DE PROPAGACIÓN DE FRUTALES: TALLERES REALIZADOS EN AGROTINS 2025

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ABSTRACT

This project aims to train students and farmers in the implementation of vegetative propagation techniques for fruit trees, contributing to the strengthening of regional fruit farming. Through practical activities, including overcoming dormancy, cutting, and stem sectioning, participants had the opportunity to acquire technical knowledge applied to the production of quality seedlings. The activities were carried out at the Unitins Agrotechnology Showcase at Agrotins, promoting interaction between academia, the production sector, and the community. The results indicate that the practical training fostered an understanding of propagation methods, favoring the generation of new perspectives for increasing productivity and sustainability in family farming. Thus, the project contributes to the training of qualified professionals and the development of fruit farming in Tocantins, encouraging the adoption of innovative and sustainable practices in the agricultural sector.

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Keywords: Agriculture. Mango. Pineapple.

RESUMO

O presente projeto tem como objetivo capacitar estudantes e agricultores na implementação de técnicas de propagação vegetativa de árvores frutíferas, contribuindo para o fortalecimento da fruticultura regional. Por meio de atividades práticas, incluindo superação de dormência, estaquia e seccionamento de caule, os participantes tiveram a oportunidade de adquirir conhecimentos técnicos aplicados à produção de mudas de qualidade. As ações foram realizadas na Vitrine Agrotecnológica da Unitins na Agrotins, promovendo a interação entre academia, setor produtivo e comunidade. Os resultados indicam que a capacitação prática promoveu a compreensão de métodos de propagação, favorecendo a geração de novas perspectivas para aumento da produtividade e sustentabilidade na agricultura familiar. Assim, o projeto contribui para a formação de profissionais capacitados e para o desenvolvimento da fruticultura no Tocantins, estimulando a adoção de práticas inovadoras e sustentáveis no setor agrícola.

Palavras-chave: Agricultura. Manga. Abacaxi. Pinha.

RESUMEN

Este proyecto busca capacitar a estudiantes y agricultores en la implementación de técnicas de propagación vegetativa de frutales, contribuyendo así al fortalecimiento de la fruticultura regional. Mediante actividades prácticas, como la superación de la latencia, el corte y el seccionamiento de tallos, los participantes tuvieron la oportunidad de adquirir conocimientos técnicos aplicados a la producción de plántulas de calidad. Las actividades se llevaron a cabo en la Vitrina de Agrotecnología Unitins en Agrotins, promoviendo la interacción entre la academia, el sector productivo y la comunidad. Los resultados indican que la capacitación práctica fomentó la comprensión de los métodos de propagación, favoreciendo la generación de nuevas perspectivas para aumentar la productividad y la sostenibilidad en la agricultura familiar. De esta forma, el proyecto contribuye a la formación de profesionales cualificados y al desarrollo de la fruticultura en Tocantins, fomentando la adopción de prácticas innovadoras y sostenibles en el sector agrícola.

Palabras clave: Agricultura. Mango. Piña.

1 INTRODUCTION

The vegetative propagation of tree fruit trees comprises the use of techniques such as stem cutting, layering (aerial stratification) and grafting, aiming at the rapid and efficient multiplication of plants. These methods allow obtaining genetically uniform individuals, preserving desirable agronomic characteristics of the mother plant. In addition, propagation plays a role in maintaining the quality of propagative material and the economic viability of fruit growing, contributing to standardization and increased productivity in production systems (Sahu, 2024).

Among the techniques of vegetative propagation, cuttings stand out as a widely disseminated method, of low cost, simple execution and quick application, being widely used in the production of forest seedlings. The process consists of the use of parts of a mother plant with the capacity to originate a new complete plant, which requires the formation of an adventitious root system in the cuttings. The success of rooting and survival of these structures depends on several factors, which can be endogenous, such as the hormonal balance and age of the parent plant, or exogenous, such as the application of plant regulators (Zhang *et al*., 2016; Foladori-Invernizzi *et al.,* 2021).

In addition, the maturity of the material used is a determining aspect, since it directly influences the concentration of endogenous auxins, the degree of tissue lignification and the accumulation of root-inhibiting substances. Another important factor is the time of year when the material is collected, since the physiological conditions of the mother plant vary according to the period, affecting the induction of adventitious rooting of plant propagules (Foladori-Invernizzi *et al.,* 2021).

Among the main advantages of vegetative propagation, the possibility of rapid and large-scale production of high quality seedlings, with genetic uniformity and preservation of the desirable agronomic characteristics of the mother plant, stands out. In addition, when well conducted, these methods can contribute to obtaining pathogen-free plants, favoring the health of the propagative material and the success in establishing crops (Petri *et al*., 2019; Costa *et al*., 2019).

Based on the relevance of vegetative propagation techniques for fruit growing, the main objective of this work was to carry out a practical workshop aimed at the demonstration and application of these methods, with emphasis on the production of seedlings of fruit species.

The activity sought to provide participants with the experience of stem cutting procedures, overcoming dormancy, combining theoretical knowledge with field practices. In this way, the workshop contributed to the technical training of the participants, promoting the

understanding of plant multiplication processes and the importance of the quality of propagative material in the sustainability and efficiency of agricultural production.

2 METHODOLOGY

The development of the project involved a series of practical and theoretical activities, aimed at the application and improvement of techniques related to the propagation of fruit species. Among these activities, the procedures aimed at overcoming the dormancy of pine cone (*Annona squamosa*) seeds, the sectioning of vegetative parts of pineapple (*Ananas comosus)* and blackberry (*Morus nigra*), in addition to the performance of germination tests with mango (Mangifera indica) seeds, were highlighted. All these actions had as their main objective to train the participants, providing them with technical and practical knowledge about the methods of multiplication of these crops.

To make it possible to overcome the dormancy of the pine cone seeds, the participants carried out the process of mechanical scarification. This procedure consisted of carefully sanding the seeds in order to break the integumentary barrier, which hinders the absorption of water and delaying germination, with scarification, it became easier for water and oxygen to enter, essential factors for the beginning of the germination process (Chaves, 2011).

After this initial stage, the seeds were sown in a commercial substrate of the Plantmax® type, composed of peat, composted pine bark, expanded vermiculite and addition of mineral nutrients in small quantities, ensuring good aeration, water retention and adequate conditions for root development. Then, the containers with the seeds were kept in a nursery, where they received constant monitoring and proper management.

From these actions, the participants were able to follow the entire germination process and the initial development of the seedlings, making daily records on the speed of germination, the growth of the plants and carefully observing aspects related to the breaking of dormancy and the formation of the first vegetative structures.

Regarding mango seeds, the students received samples for sowing in order to investigate and overcome possible dormancy mechanisms. The seeds were stored in substrate and kept under controlled conditions, allowing the monitoring of the germination process. In some seeds, it is possible to observe the occurrence of polyembryony, a common characteristic in mango seeds, evidenced by the emergence of multiple seedlings from a single seed.

In the case of pineapple, the participants performed the stem sectioning technique with the objective of obtaining shoots for vegetative propagation. For this, cutting instruments were used, such as a machete and pruning knife, allowing the cutting and preparation of the adult

stems of the plant. The stems were divided into segments and sanitized for the rooting process and, later, packed in perforated trays containing sand as substrate. The units were kept under controlled irrigation, favoring the ideal environment for rooting.

The development of the shoots was monitored over time, observing the emission of roots and the growth of the aerial part, contributing to the formation of new plants from the propagative material. Blackberry propagation was performed using the cutting rooting technique. The students prepared the cuttings using plant parts of the blackberry plant, which were cut with the use of pruning shears or pruning knife, ensuring segments with healthy vegetation and suitable for rooting.

These cuttings were treated with IBA (indolebutyric acid) rooting hormone at a concentration of 1000 $mg/^{L-1}$ to stimulate root formation. Then, the cuttings were inserted into plastic bags with vermiculite substrate, kept in a high humidity environment, using bags to create a humid chamber, optimizing rooting conditions.

3 RESULTS AND DISCUSSION

Before the start of the practical activities, the participants had an introductory class to deepen their knowledge, in which the fundamental principles of fruit plant propagation were addressed. Where topics such as the types of propagation (sexual and asexual), the physiology of rooting, the importance of the use of rooting hormones, as well as guidance on the proper management of the environment for the production of seedlings were discussed. This theoretical basis was important for the participants to understand the scientific foundations behind the techniques that would be used, providing a better assimilation of the contents during practice.

Figure 1

Theoretical exposition on plant propagation techniques during the Agrotechnological Showcase at Agrotins

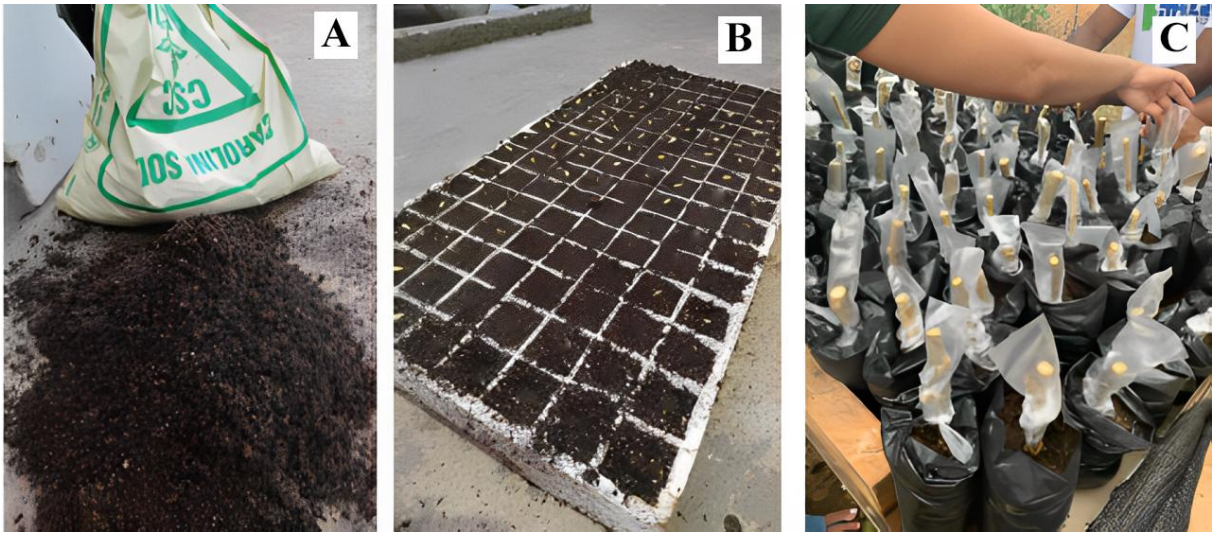
Source: Author, 2025

The practice of fruit propagation plays an important role in the development of the technical skills and theoretical understanding of the participants. By carrying out the procedures, the students experienced in practice the processes of vegetative propagation, consolidating theoretical knowledge, such as the importance of using rooting hormones, management of a humid environment and observation of root development. This procedure allowed students to perceive the relationship between theory and practice, strengthening important skills for the training of future agricultural professionals.

In addition, by following the progress of the seedlings, the students developed observation, recording and data analysis skills in research and in the extension of agriculture. The execution of the technique promoted the understanding of the challenges and care necessary in the propagation of fruit plants, emphasizing the importance of practical learning for the preparation of technicians capable of contributing to agriculture.

Figure 2

Practical plant propagation activities carried out by the participants: a) Prepared substrate; b) Planting seeds in a controlled environment for germination; C) Cutting of vegetative material of fruit trees



Source: Author, 2025

4 FINAL CONSIDERATIONS

The development of the project "Fruit Propagation Practices" during the Agrotechnological Showcase of the State University of Tocantins (Unitins) at the Tocantins Agricultural Technology Fair (Agrotins) allowed to provide participants with technical-practical training, consolidating theoretical knowledge through experiential and field activities. The workshop contributed to arouse interest and improve skills in vegetative propagation techniques, such as grafting, cutting, overcoming dormancy and stem sectioning, essential for the production of quality fruit seedlings.

In addition to strengthening technical skills, the project also contributed to expanding the participants' understanding of the importance of sustainable agriculture, highlighting practices that reconcile production and environmental preservation.

At the same time, it encouraged reflection on crop diversification as a strategy to increase the resilience of production systems, reduce economic risks, and promote greater food security. These experiences not only enriched their academic training, but also awakened in the participants a more critical and responsible view of the role of agriculture in regional development.

Thus, the project collaborated to train more prepared and aware professionals to work in the agricultural production chain of Tocantins, with special emphasis on fruit growing, a sector with great potential for generating income and strengthening the local economy.

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