

Effective horticultural production systems in Valle del Cauca **Sistemas de producción hortofrutícolas efectivos en el Valle del Cauca**

The agricultural sector constitutes one of the main economic branches of Colombia. However, in the last two decades, this sector has had lower growth than that of the national economy. According to the National Business Association of Colombia (ANDI), between 2001 and 2020, the growth of the agricultural sector was 2.9%, 10% less than that of the national economy, which reached a value of 3.3%. Considering the importance of this sector in the economic and social well-being of the rural communities of the country, as well as the growing demand for food due to the increase in world population, it is important to prioritize policies, programs, and projects that help boost the agricultural sector at a national and regional level.

The recent agricultural development in the country has been deeply influenced by international events, such as the confrontation between Russia and Ukraine, which have significantly affected the price of agricultural supplies, reaching historical highs. Considering that a large part of rural producers in Colombia are classified as small and medium producers with small production plots, these market fluctuations impact their cost structure, putting them in vulnerable situations that affect their economic well-being. Therefore, it is necessary to find solutions that minimize the exposure of producers to market fluctuations without sacrificing their productive yields or their sustainability in the short or long term. This is why we must seek to make efficient use of available resources and implement transition processes from traditional systems towards a rapid substitution of supplies through agroecological principles.

The Valle del Cauca department has the largest extension of areas dedicated to permanent agricultural exploitation in the country, producing, according to information obtained from the Ministry of Agriculture and Rural Development, around 20.5 million tons every year. In this department, several efforts have been made to promote the development of the agricultural sector. Since 2006, the *Plan Frutícola del Valle del Cauca* was adopted, where 16 fruit species were prioritized based on the economic, climatic, technological, environmental, and social conditions of the department. Based on this plan, several projects have been developed with a common objective of transferring technical knowledge to improve agronomic practices, as well as strengthening small-producer associations. The *Programa Integral de Fruticultura* (PIF), executed by the Corporación para el Desarrollo Social y Cultural del Valle del Cauca -Corpovalle-, has been positively impacting the agricultural sector in the department since 2017, especially the aspects of associativity, competitiveness, and productivity of small and medium producers. The results of the different phases of the PIF have brought great progress in the social well-being and economic development of the region.

However, given the global and national conditions already mentioned, it is necessary to go further and look for alternatives to the use of chemical fertilizers in the production processes. An approach that allows for both an efficient and an environmentally friendly production, that protects, preserves, and maintains the department's natural resources through time. Aiming for the sustainability of agriculture as a profitable and long-term business for the local communities, and achieving the rational use of resources, as well as the recognition of farmers as key players in all processes. This last point has been identified as a fundamental aspect to further develop. Through the experience and results obtained in the implementation of the different phases of the PIF in Valle del Cauca, it has been shown that, although strengthening the organizational processes of associations has had significant impacts on them, it is also important to direct efforts towards the associates themselves. While technical and technological knowledge is

important for farmers to optimally develop production activities on their farms, soft skills are necessary for the day-to-day activities of producers and the associations to which they belong. Therefore, a comprehensive strengthening of the agricultural sector in the Valle del Cauca department must be sought to improve the technical and social capacities of producers, as a mechanism for long-term sustainability.

A complete intervention will not only aid with more efficient resource management, which can help improve production levels per hectare, but it can also help consolidate associative schemes through the individual strengthening of the members' capabilities. This can open the door to benefits from mechanisms such as economies of scale, as well as other mechanisms that strengthen their market positioning and their capacity to offer products in agri-food markets. Likewise, including agroecology concepts and achieving the transition from the use of chemical to organic supplies can help improve the sustainability level of productive activities and contribute to the recovery of soils -while avoiding exposure to fluctuations in the agricultural input market-, allowing for a more efficient use of resources.

It is essential to take another step into the consolidation of the agricultural sector by maximizing the efficiency in the use of resources to reduce or stabilize production costs -which are being affected by global dynamics-, and to achieve the maximum production level possible with the available resources, while taking care of the department's natural resources. This requires interventions with precise production processes and a well-founded diagnosis of all the factors involved. This can be complemented with a comprehensive intervention that includes the social aspects that affect the development of farmers as individuals, the consolidation of individual and collective competencies, and the intervention of farmer associations from a social aspect to strengthen the interaction of their members and guarantee that these associative mechanisms reach adequate levels of sustainability. The implementation of these alternative methodologies based on agroecological concepts would allow for promoting the economic, social, and environmental development of the rural areas of the department while impacting the regional and national economy.

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