REPORT

SUSTAINABILITY OF TARA

(Caesalpinia spinosa)

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Lima, November 13, 2023

INTRODUCTION

Molinos Asociados S.A.C. is a company that is always at the forefront of its management and production systems. For this reason, it is always aware of the need to innovate in order to respond to a constantly changing and highly competitive environment, where the satisfaction of consumer requirements in terms of safety, quality and respect for the environment is a priority.

To achieve these quality and safety characteristics, the organization has a production system that ensures the production of healthy and safe products and has implemented various programs and management systems, such as the case that focuses on ensuring that the products are adequate, with respect to environmental care has implemented a production system that involves the conservation of natural resources, adapting agricultural practices to the requirements of the production environment. The production is recognized for basing its management on processes and not on inputs, that is, the solutions to the problems faced are not external synthetic inputs such as pesticides or fertilizers, but on the contrary, they are agronomic, biological and mechanical management methods. These methods are based on a better observation and knowledge of the reality of the farm and the use of nature to improve the health of the production system. Thus, we will be able to know the usual problems of the environment, to anticipate them, to look for preventive solutions, to use the processes and to achieve long term productivitie.

Through productive management, it is possible to maintain a sustainable agriculture that preserves and enhances natural resources, promotes preventive health care and well-being, both for farm workers and consumers, as well as for the organisms that make up the ecosystem. When we talk about high quality products, our products must be free of pesticide residues, in addition to the characteristics required of conventional products, such as color, size or texture. Those who produce, transform, market or consume products must protect the shared environment, which includes landscapes, climates, habitats, biodiversity, air and water.

Sustainable agriculture must be based on relationships that ensure justice with respect to the common environment and life opportunities, that is, relationships of equality, respect and responsible management of the shared world, both among human beings and in their relationships with other living beings. In other words, all those involved in agriculture must conduct their relations in such a way as to ensure justice at all levels: producers, agricultural workers, industrializers, distributors, marketers and consumers, by defining practices and strategies for the conservation and improvement of natural resources, by carrying out and implementing activities for the generation and transfer of technologies within the framework of the rational use of resources, land and water, as well as the protection of the environment, i.e. in economic, ecological and social terms.

Agriculture must provide a good quality of life for all, contribute to food self-sufficiency and poverty alleviation, and provide animals with living conditions consistent with their physiology, natural behavior and well-being. The natural resources used for production and consumption must be preserved as a legacy for future generations, so that they can enjoy them in the same way as current generations.

In this sense, **Molinos Asociados S.A.C.**, in order to prevent and eliminate risks to food safety and environmental protection, has taken the firm decision to implement controls in the field for the production of Tara in pods until the finished products are obtained.

OBJECTIVE

- Avoid the use of pesticides to prevent contamination of the product, the environment and the health of workers.
- Ensure product safety and quality based on responsible production, safe conditions and practices in the workplace.
- Collective reflection for the implementation of the MOP.

SCOPE

This manual has been prepared by **FORESTAL DON GUILLERMO S.A.C.**, a sister company of **MOLINOS ASOCIADOS S.A.C.**, for the fertilization, pest control, harvesting, storage of raw material, reception, production, storage and shipment of Tara Vaina.

INTERNAL REGULATIONS

Environmental Protection

- Do not use prohibited substances.
- No unjustified burning.
- Management of inorganic waste.
- Use constructed latrines.
- Protect and properly manage water sources and reforest as much as possible.

Maintain and improve soil fertility

- Preparation, handling and proper application of fertilizers.
- Creation of conservation barriers.
- Planting on contour lines.

Crop Management

- Propagate varieties adapted to the area.
- Prohibit the introduction of GMO seeds.
- Control pests and diseases with appropriate methods (traps, etc.).
- Establishment of buffer zones where necessary.

Producer Documentation Management

- Maintain information on field activities in the records provided by the Quality Assurance Department.
- Maintain other documentation provided by the Quality Assurance Department.

Inspection

- Allow access to any area deemed appropriate by the certifier's or the government's internal or external inspector, and provide the necessary information at the time of control or inspection.

Use of tools and equipment

- Including: Motorized and manual backpacks, shovel, sapa pico, motor scythe, pruning shears (normal and telescopic), chain saw, wheelbarrows (bugí), scales, parihuelas, sacks, barretas, among others, must be cleaned and/or washed three times, if necessary, to avoid cross contamination.
- Only the company's own equipment may be used.

SUSTAINABLE MANAGEMENT OF TARA PRODUCTION

Sustainable management involves practices or ways of managing natural resources so that they are not depleted. In this way, while satisfying our needs in the present, it ensures that they can continue to do so in the future.

MOLINOS ASOCIADOS S.A.C., owns 100 hectares of its allied company **FORESTAL DON GUILLERMO S.A.C.**, which are represented as follows.

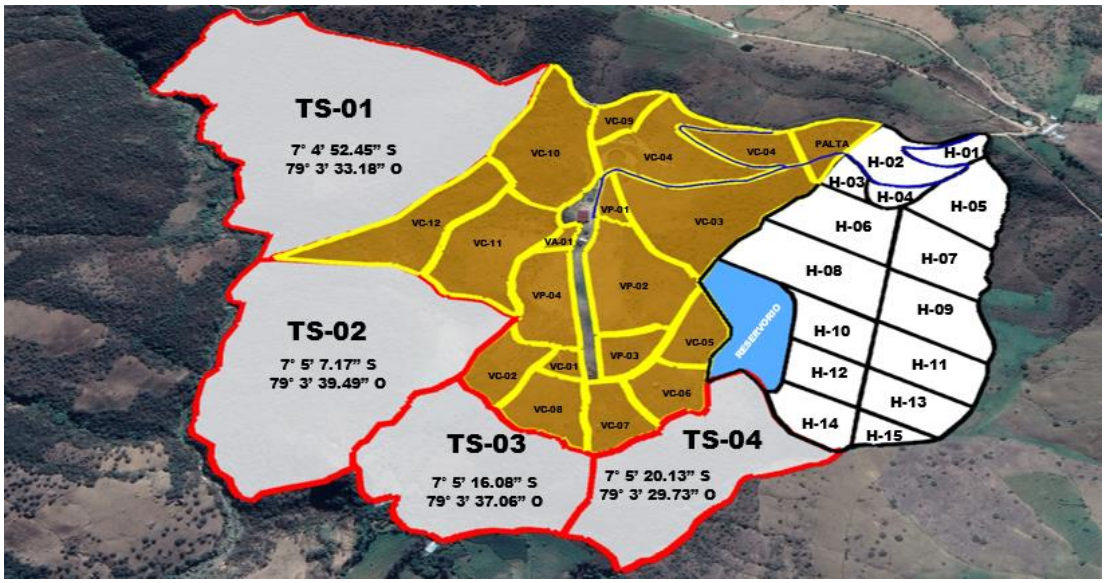

Figure 01: Shows the division of the FDG farm plots.

Among its qualities is the ability to restore degraded areas.

Through bacteria that live in its roots and make this element available for plants to absorb, this legume fixes nitrogen from the air into the soil. Nitrogen is a necessity for plants to grow strong and emerald green. The alternative to chemical fertilization, which is expensive and has the potential to contaminate water sources, for poor soils is tara, a natural fertilizer. Tara roots naturally fix and store nitrogen.

Because of its deep roots, it can better absorb water from lower soil levels. Tara roots can access and absorb water and moisture from within the soil even when the surface is dry, increasing the humidity in the area where they grow. Tara's roots allow it to survive in arid environments and droughts.

It acts as a protective plant for other plants, making it easier for them to establish by protecting them from wind and drought. It also provides them with food. Even under its canopy, where its shade is less dense, plants can grow.

Figure 02: Trees protect the soil.

It provides pollen and nectar to the insects that pollinate its flowers. It blooms for only 30 to 45 days, compared to newly introduced plants such as eucalyptus, which bloom for three months. Although it occurs only twice a year, the survival of native pollinators such as bumblebees, wasps, solitary bees, and stingless bees is critical because tara is a native plant. These insects are excellent pollinators, especially of certain regional plants. Tara and other honey-producing plants enable the development of beekeeping as a secondary source of income for rural households. Beekeeping secures and increases the food supply, as bees are responsible for pollinating most plants with edible fruits, such as citrus fruits, avocados and guavas. Beekeeping also produces products such as honey and pollen for home consumption and sale.

It provides local wildlife with a place to live and feed. Its thorny branches protect nesting birds, especially hummingbirds, and its tender seeds provide food for both birds and rodents. Little is known about all the creatures that inhabit or consume ryegrass, especially small creatures such as insects or spiders. However, the presence of praying mantises, whose wings resemble Tara leaves, suggests that many more insects live on this tree than the mantises consume. In other words, this tree helps ecosystems recover and maintain their biodiversity.

Decomposing leaf litter from this plant produces high quality organic matter. The nutrients that are returned to the soil to feed the plants are found in the organic matter. Without organic matter, the soil would be nothing but rock.

The branches, leaves and roots protect the soil from erosion and loss by water and wind. Before a heavy rain hits the soil, the leaves absorb the impact and the roots create a structure that supports and protects the soil. This is especially important in sloping areas. Trees provide the natural channels needed for rainwater to infiltrate the ground and then recharge surface

water sources such as rivers. By acting like giant sponges that can absorb and store large amounts of rainwater, forests clean and filter the water that falls on them. Forest soils absorb four times more rainwater than grasslands and eight times more than bare ground.

Figure 03: Tara trees with lush foliage.

Through the shade provided by its canopy and the leaf litter that covers the ground, it prevents overheating of the soil surface and evapotranspiration or water loss.

It helps clean up the environment and traps gases responsible for climate change and the greenhouse effect.

Tara is currently used commercially, along with other forest products such as natural grasses ("nudillo", "grama", "punjo"), for cattle grazing.

SEEDBED

It consists of the mixture of three ingredients: soil, sand and compost (decomposed manure, humus, etc.), previously sieved. This mixture is made in the ratio 3:2:1, which makes the substrate. It is important to consider the aspect of the soil to be used. To bag the substrate, use flat black medium-density polyethylene bags, fill them well, making sure they have a good consistency without compacting them too much, and then place them in the planting beds.

The seedbed is placed in sand beds covered with fine sand up to a thickness of 20 cm2 and the hydrated seeds are treated as follows.

a) Each kg of hydrated seed is distributed in one m^2.
b) Once the seeds have been distributed, cover them with 1 cm of sand and black plastic for one week.
c) Water daily to create a favorable microclimate for the cotyledons.
d) Remove the black plastic and place a 30 cm high shelter made of reed, netting or other material to protect the seedlings from sunlight.
e) After one week, repot the seedlings.

Figure 04: Tara seedlings ready for planting.

Figure 05: Tara seedlings in the process of growth.

SEEDING

The planting system of the tara is done taking advantage of the soil is wet by the effects of rainfall in the winter season, or when the properties are under irrigation, and can be done:

In holes. It is done by preparing the seedlings in seedbeds, after they reach a certain height (25 to 30 cm), they are transplanted in the prepared holes, this plantation will have an agroforestry management to obtain vigorous trees.

Figure 06: Tara tree planting with drip irrigation system.

Cleaning and Protection

Cleaning. This is the weeding and fertilizing of the seedlings to eliminate the native vegetation growing next to them. This activity should be done before the vegetation matures (weeds) to prevent their multiplication and poor nutrition of the plant.

Figure 07: Tara plants free of weeds.

Protection. It starts at the borders, where the plants are tended by the owners, until they reach a size and consistency that makes them resistant to the damaging action of insects (ants, spiders), animals (cattle, others), passers-by and natural phenomena (rain, landslides, hail, etc.). The plants found in the fences have limitations in terms of natural reproduction due to

the presence of cattle that consume the leaves and small stems of the seedlings, delaying their natural regeneration and preventing an adequate restitution of new specimens.

RESTORATION OF WILD TARA

The recovery of the trees and areas with wild tara, has been done with the pruning of the trees, eliminating dead branches of the plants, removing the weeds that entangled and surrounded the plants, preventing their normal development, but avoiding that the soil is bare and exposed to erosion, since the bare or bare soils: Are vulnerable to the erosive action of wind and water; Receive the sun's rays directly, which can cause the death of living organisms that inhabit it and that recycle nutrients and easily lose moisture.

Figure 08: Tara Silvestre trees.

Figue 09: Recovered Tara Silvestre trees.

Figure 10: Recovered areas of wild tara and transplantation of tara seedlings with a mechanized irrigation system.