

## TECHNICAL DATA SHEET

### TURMERIC

#### Section A: Information on the Planting of Turmeric Cultivation

<b>A.1</b>	<b>Main producing areas</b>	Turmeric cultivation adapts to the current conditions of the southern region of the country.		
<b>A.2</b>	<b>Main Use:</b>	Fresh or dehydrated product. In the food industry, it is processed to obtain flours, juices, drinks, teas, supplements, among others.		
<b>A.3</b>	<b>Main export destination</b>	Europe / North America and Central America		
<b>A.4</b>	<b>Turmeric growth curve</b>	0-60 days: Development of leaves, roots, and pseudostem.		
		61-75 days: Vegetative growth and rhizome formation.		
		76 days - harvest: Rhizome filling.		
<b>A.5</b>	<b>Edaphoclimatic requirements</b>			
<b>A.6</b>	<b>Temperature</b>	20°C - 30°C	<b>Precipitation</b>	1500 to 2000 mm per cycle.
<b>A.7</b>	<b>Altitude</b>	0 - 1500 msnm		
<b>A.8</b>	<b>Soil</b>	Loamy texture, deep and well-drained, allowing adequate development of rhizomes and with a high organic matter content.		
<b>A.9</b>	<b>Planting Material</b>	Turmeric propagates asexually, through sections of the rhizome or secondary rhizomes (fingers).		
		The selection of planting material or seed is a key factor in the success of this crop's production.		
<b>A.10</b>	<b>Planting Season</b>	In Costa Rica, this crop can be planted at any time of the year if irrigation is an option, mainly during the dry season (January to May). However, most plantings take place between May and June, with the start of the rainy season, and harvesting occurs during the dry season.		
<b>A.11</b>	<b>Planting</b>	The seed (sections of the rhizome) is placed on the ridge or bed every 30 to 50 cm, in holes 8 to 12 cm deep, while the fingers can be sown at a depth no greater than 8 cm.		
<b>A.12</b>	<b>Planting distance:</b>	The planting distance between plants can be between 30 to 40 cm. The distance between ridges or rows can range from 50 to 70 cm.		
	<b>Weed control:</b>	The critical period is the first 75 days. To achieve proper control, the strategy starts during land preparation, which should be done at least 20 days in advance to stimulate weed germination. Once the weeds have sprouted, control is done through manual removal.		
	<b>Hilling:</b>	Hilling is a practice that can be carried out 30 and 90 days after planting. However, with proper land preparation, loose soils, and high ridges or beds, hilling is not necessary.		

#### Section B: Harvest and post-harvest of turmeric

<b>B.1</b>	<b>Harvest maturity: from nine months onwards.</b>
	Plant maturity is indicated when a yellowing and drying of the leaves are observed.



<b>B.2</b>	<p><b>Harvest: Turmeric is harvested between 9 and 11 months after planting. The yield reported in Costa Rica ranges from 19 to 23 t/ha.</b></p>
	<p>It may require between 14 to 20 man-days to harvest one hectare of turmeric, making this activity the one with the highest demand for human resources and the most costly.</p>
	<p>Manual harvesting begins with cutting the stems and leaves flush with the ground, then the rhizomes are extracted from the soil with the help of a hoe. Once the rhizomes are harvested, they are shaken to remove the soil, their roots are removed, and they are placed in baskets or plastic boxes. It is not recommended to use sacks as they can cause mechanical damage.</p>
<b>B.3</b>	<p><b>The quality standard for marketing fresh turmeric product is: secondary rhizomes or fingers with a minimum size of 2.5 cm in length and 1 cm in thickness.</b></p>
<b>B.4</b>	<p><b>The rhizomes are sensitive to dehydration, so it is recommended not to leave them exposed to the sun for a long time.</b></p>
<b>B.5</b>	<p><b>Post-harvest handling</b></p> <p>Exposure of the product to sunlight should be avoided to reduce issues with burns, dehydration, and softening of the rhizomes.</p> <p>The baskets are stacked one on top of the other, so it is not recommended to fill the basket completely.</p> <p>From the mother rhizome, secondary rhizomes emerge, and from these, tertiary rhizomes. The marketable rhizomes are the hands that make up the secondary and tertiary ones</p>
<b>B.5.1</b>	<p><b>Post-harvest activities</b></p> <ol style="list-style-type: none"> <li>1. Removal of soil through the washing of rhizomes.</li> <li>2. Disinfection to sanitize the surface of the rhizome.</li> <li>3. Reduction of excess moisture through the drying process.</li> <li>4. Packaging in corrugated cardboard boxes or plastic boxes.</li> <li>5. The recommended temperature for storing and transporting turmeric to international markets is between 12°C to 14°C.</li> </ol>

## Section C: **Information on production costs**

<b>C.1</b>	<p><b>Total production cost per hectare € 2,300,000.00</b></p>
<b>C.2</b>	<p><b>Gross income per hectare € 6,000,000.00</b></p>
<b>C.3</b>	<p><b>Net income per hectare € 3,705,317.00</b></p>

## Section D: **Flour production**

<b>D.1</b>	<p>An alternative to adding more value to turmeric production is the production of flours, from which turmeric and curcumin are extracted. The raw material used for this process is the rhizomes (fingers and mother rhizomes) that do not meet the qualities for fresh produce or due to market situations, the fresh produce can be transformed into flours, preventing its loss and facilitating its preservation. Turmeric is used as a dye in the food, cosmetic, and textile industries. In addition, it is attributed with medicinal properties. In the food industry, it is used as a flavoring and coloring agent.</p>
<b>D.2</b>	<p><b>Process for flour extraction</b></p> <ol style="list-style-type: none"> <li>1. Washing the rhizomes</li> <li>2. Cutting into small sections</li> <li>3. Disinfection</li> <li>4. Drying</li> <li>5. Grinding</li> <li>6. Packing</li> </ol>
<b>D.3</b>	<p><b>Recommended temperature for drying in conventional ovens: 50°C to 70°C.</b></p>