SLOPEHELPER

Power Harrow

Rotary soil cultivation in root areas

The power harrow is a specialized rear-hinged attachment designed for superior soil cultivation around tree trunks and in root zones. It operates by rotating a dual-blade tiller, which follows a precise trajectory around tree trunks, ensuring effective soil aeration, weed control, and optimal root zone conditioning without damaging the trees.

100% Autonomous | 100% Electric

Features & Benefits

Fully Electric Operation – No Hydraulic Actuation

This electrically driven attachment ensures consistent performance and efficiency without relying on hydraulic actuation. All instrument functions are based on electromechanical solutions powered by brushless motors, eliminating the need for hydraulic oil and actuators, thereby reducing leakage risks, maintenance demands, and environmental concerns.
The electric-driven tiller enables gentle and precise operation in root areas, minimizing the risk of structural damage to both the soil and the equipment. In case of encountering unmovable obstacles, the system reacts smoothly, preventing potential harm to the instrument.

Encoder-Based Soft Contact Sensor & Suspension Frame

The instrument features an encoder-based soft contact sensor integrated into a specially designed frame around the tiller head. Unlike traditional discrete sensors, this system continuously calculates the real-time distance between the tiller and the tree trunk, ensuring precise and adaptive operation around trees. The suspension frame is supported by strings, making it significantly gentler on trees compared to electromechanical or hydraulic switches. This design prevents overloading or hitting tree trunks, allowing for smooth and damage-free cultivation in delicate root areas.

Leaf Spring-Amortized Tiller Head

Conventional power harrows suffer from strong impacts caused by stones and obstacles in the soil, as their rigid connection to the instrument frame prevents the tiller blades from adapting to uneven terrain. This often results in blades breaking or frame damage due to the inability to "float" around small stones or shift them while maintaining their rotation trajectory. The Slopehelper Power Harrow features a unique tiller head suspension system with leaf spring amortization, allowing the blades to flexibly navigate around obstacles instead of absorbing direct impacts. This innovation minimizes structural damage, prolongs equipment lifespan, and ensures smoother, more reliable soil cultivation in challenging conditions.

Emergency System for Damage Prevention in Case of Jamming

Field operations are inherently unpredictable, and unexpected obstacles can pose serious risks to both equipment and plantation infrastructure. Situations such as loose wires getting entangled in the root area, the tiller head becoming stuck on a post, or large debris jamming the blades can lead to significant damage. In conventional systems, even a skilled operator may have little time to react, and in robotic operations, immediate manual intervention is impossible without special safety mechanisms. The Slopehelper Power Harrow incorporates an innovative emergency protection system to prevent such damage. The entire instrument is suspended on a special frame, which can detect sudden rotational resistance or jamming of the tiller head. If the system detects an obstruction, it immediately stops the machine, preventing damage to both the equipment and the plantation. This smart safety mechanism ensures reliable and damage-free operation, even in the most challenging field conditions.

Automatic Height Regulation for Hard Soil Adaptationns

Soil conditions are highly variable and unpredictable, often transitioning from soft to hard zones during operation. In conventional tillers, this shift causes undesirable vibrations, potential equipment damage, reduced efficiency, and loss of rotational speed, ultimately affecting cultivation quality.The Slopehelper Power Harrow features an advanced automatic height regulation system, which continuously monitors soil density and adjusts the tiller depth in real time. When encountering harder soil, the system gradually reduces the tilling depth to maintain efficiency, protect the equipment, and ensure gentle soil cultivation. This allows for progressive conditioning of compacted areas over multiple passes, ensuring consistent, high-quality soil preparation without excessive strain on the machine.

Interchangeable Tiller Blades for Various Soil Conditions

Different field environments and soil types require specific blade designs and configurations to achieve optimal cultivation. The Slopehelper Power Harrow is equipped with an easy blade-change system, allowing operators to adjust both the blade type and quantity as needed. This flexibility ensures efficient soil processing, improved durability, and precision cultivation, making it adaptable to a wide range of agricultural conditions and operational requirements.

Technical Specifications

DIMENSIONS	VALUE
Height	1880 mm
Length	1100 mm
Width	1610 mm
Weight	600 kg

WORKING DIMENSIONS	VALUE
Working width	720 mm
Depth of harrowing	80-200 mm
Diameter of harrow disk	270 mm
Width of the tilling area	285 mm
Start distance from edge of the caterpillars	250 mm
Operation speed	2 km/h

GENERAL SPECIFICATIONS	VALUE
Compatibility	SH.056 Slopehelper
Drive method	
Number of belts	
Motor	Brush-less motor - BLDC

Technical Specifications

BLADE SPECIFICATIONS	VALUE
Speed of rotation	100-200 rpm, selectable
Type of blades	
Number of blades	2

Technical drawing of power harrow

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