AGILEHELPER

Grassfighter

3-1-solution for vineyards and bushes

The Agilehelper Grassfighter is an all-in-one **autonomous grass and soil management solution** engineered to maximize efficiency while reducing operational costs. Designed as a fully electric system, the Grassfighter seamlessly integrates **three essential tools**—a Power Harrow, Cutter, and Drum Mulcher—into a single compact machine.

By combining soil preparation, grass cutting, and mulching in one pass, the Grassfighter **eliminates the need for multiple machines** and **manual intervention**, saving valuable time and labor. Its autonomous operation ensures consistent performance across varying conditions, making it a cost-effective, eco-friendly, and highly efficient choice for vineyard and orchard floor management.

100% Autonomous | **100% Electric**

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1. Drum Mulcher

Branches and grass mulching in passages by cutting-edge hammer flails

A drum mulcher is a specialized tool designed **for processing pruned branches and vegetation in plantation passages**. It effectively **reduces wood debris** into fine mulch, promoting **faster decomposition** and a **cleaner plantation environment**. Additionally, it excels at mulching dense, tall, and tough grass, ensuring **a well-maintained** and **aerated plantation floor**.

100% Autonomous | **100% Electric**

Features & Benefits - Drum Mulcher

Frontal-Hinged Design for Superior Mulching Efficiency

This innovative attachment ensures **optimal mulching performance** by preventing branches from being pressed into the soil—unlike rear-mounted drum mulchers on conventional tractors. By **keeping branches in the ideal position**, it **minimizes the risk of fungal growth** and **promotes a cleaner, healthier plantation environment**.

Advanced Protective Amortization with Emergency Stop

Equipped with a **specialized amortization system**, this mulcher absorbs vibrations and impacts, ensuring **smooth operation** while **protecting both the instrument** and the base platform. **Integrated collision detection sensors** provide an extra layer of safety, instantly stopping operation upon detecting obstacles to **prevent damage** and **enhance durability**.

Adaptive Surface-Following Suspension for Precision Mulching

Engineered for seamless terrain adaptation, the specialized **suspension system** allows the drum **to precisely follow surface contours,** ensuring **uniform mulching quality** while **minimizing instrument wear** and **damage**.

Customizable Cutting Heights for Maximum Versatility

The **cutting edge height of the hammers can be effortlessly adjusted** from the instrument's menu, providing **flexibility for diverse operational needs**. For ultra-low cutting applications, **an optional wheel installation** enhances performance, ensuring optimal results across all plantation conditions.

Electrically Driven for Precision and Efficiency

Powered by an **advanced electric motor**, this attachment ensures **consistent performance with stable RPM** (revolution per minute), delivering a precise and uniform mulching process. Unlike hydraulic or mechanical alternatives, it provides **superior mulching quality**, minimizing unprocessed debris and **enhancing overall plantation maintenance**.

Multi-Sectional Design for Maximum Stability and Performance

Featuring a **segmented shaft** with independent, internally separated sections, this innovative structure **optimizes branch processing** while **eliminating balance issues** found in traditional designs. The unique engineering allows for **quick, on-the-spot hammer replacement** without the need for shaft or hammer re-balancing, significantly **reducing downtime** and **maintenance efforts**.

Heavy-Duty Flail Hammers for Unmatched Durability

Built to withstand tough conditions, these **rugged flail hammers resist impacts from soil clumps, embedded debris, and thick branches** without compromising performance. Their widespread availability ensures **easy maintenance, quick replacements**, and **cost-effective operation** for uninterrupted mulching.

Back Roller for Enhanced Soil Integration

Equipped with a specialized back roller, the mulcher **presses mulched grass and branches into the soil, creating a compact** and **uniform soil layer**. This feature **improves decomposition, enhances soil coverage**, and **promotes a cleaner, healthier plantation environment**.

Technical Specifications - Drum Mulcher

DRUM SPECIFICATIONS	VALUE
Drum speed	2000 rpm
Type of blades	Hammer type
Number of blades	16

2. 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 - Power Harrow

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 brush-less 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 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 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 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 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 - Power Harrow

BLADE SPECIFICATIONS	VALUE
Speed of rotation	100–200 rpm, selectable
Type of blades	Harrow knife 0177401
Number of blades	2

3. Horizontal-vertical Cutter

Lateral and top tree cutting with columns' bypass in vineyards

The lateral and top cutting instrument is designed for **precise trimming** of grape trees. It features a **dual cutting system** with vertical and horizontal decks, equipped with **high-performance cutting knives** that easily handle thick branches and tree tops, even in poorly maintained plantations. This advanced cutting mechanism **ensures uniform shaping, optimal growth**, and **improved plantation structure**, making it a versatile and efficient solution for vineyards.

100% Autonomous | 100% Electric

Features & Benefits - HV Cutter

Lateral and Top Cutting in Any Combination

The instrument allows for lateral and top cutting in any combination, **providing the flexibility** to perform **top-only, lateral-only**, or **combined cutting**. This adaptability ensures **precise tree shaping** and **efficient maintenance**, catering to different plantation management needs.

Special Branch-Guiding Teeth for Precise Cutting

Conventional trimmers and cutters typically use large, aggressive teeth that do not cleanly cut branches or trunks but rather tear and burst them, increasing the risk of tree infections. This issue arises because small, sharp cutting teeth alone cannot hold branches in place, causing them to slide along the disk edge instead of being properly cut.

The Agilehelper HV Cutter overcomes this problem by integrating **special guiding teeth** that **securely grip branches**, keeping them in position until the precision-cutting disk slices through cleanly. This design ensures **smooth, clean cuts with no open branch ends**, significantly **reducing infection risks** and **promoting healthier tree growth**.

Adjustable Vertical Cutting Position

The vertical cutting deck **can be positioned at different heights**, allowing for precise **trimming of only the necessary vegetation**. This feature **enhances crop solarization** by **optimizing light penetration**, **improving plant health** and **overall yield quality**.

Option for Pyramidal Tree Cutting

The vertical cutting deck **can be angled relative to the tree trunk** while **maintaining its horizontal alignment**, allowing for precise pyramidal shaping of the tree canopy. This optimized cutting method enhances harvest solarization, ensuring better light distribution for improved fruit quality and yield.

Height Adaptation on Slippery Terrain

The HV Cutter features a **hinged system** that ensures **constant maintenance of the pre-set cutting geometry,** even on slippery or uneven terrain. The instrument dynamically **adapts to current slope inclinations**, maintaining desired canopy shape. This intelligent adjustment guarantees precise and uniform cutting, optimizing tree shaping and ensuring consistent harvest solarization across varying terrain conditions.

Adjustable Distance to the Row for Precise Cutting

In real-world **orchards**, plantation rows are rarely perfectly straight, meaning the **Agilehelper HV cutter** must continuously adapt its position relative to the row for accurate **thinning**.

The **Agilehelper HV cutter** is equipped with a special actuator system that automatically adjusts the instrument's lateral position, ensuring optimal alignment with the trees. This dynamic adjustment prevents flower damage from incorrect positioning and guarantees precise, uniform **thinning**, regardless of row irregularities.

Technical Specifications - HV Cutter

BLADE SPECIFICATIONS	VALUE
Drum speed	3–7 km/h
Type of blades	Blade EVO-B355 (High-grade steel)
Number of blades	8

Technical Specifications - Grassfighter

DIMENSIONS	VALUE
Height	1760 mm
Length	3960 mm
Width	1245 mm
Weight	1800 kg

WORKING DIMENSIONS	VALUE
Working slopes	Up to 38°
Minimum speed	0,5 km/h
Maximum speed	4 km/h
Maximum drive	10 kW

ELECTRIC SYSTEM	VALUE
Battery	48 V (LiFePO)
Battery Capacity	28,7 kWh
Working hours between charging	8–12 h (depending on the type of operation)
Charging time	8–10 h

GENERAL SPECIFICATIONS	VALUE
Control	Onboard computer Remote controller Autonomous Navigation system
Safety system	Electromechanical (additional collision avoidance system based on radio wave scanners)
Caterpillars	200 x 72 x 44
Gearbox stages	2 (1 chain, 1 worm gearbox unit)
Brake system	Band brake (air release)
Additional features	True-autonomous (no need GNSS) High resolution touch sensor