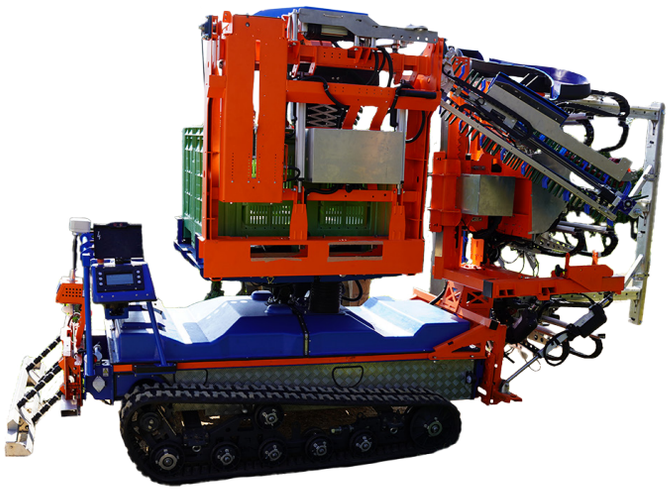

SLOPEHELPER

Fruit Picker

Autonomous fruit picking by 6 robotic manipulators

This cutting-edge harvesting instrument offers an up to 8-fold reduction in costs for one of the most labor-intensive agro-cycle operations in **fruit plantations—harvesting**. These unmatched cost savings are achieved by replacing 8 **seasonal workers** with a fully robotic solution, eliminating dependence on expensive and scarce manual labor.

100% Autonomous | **100% Electric**

The system consists of two key modules:

1. The **Fruit Distribution Module**, installed on the gravity-stabilized platform of the **Slopehelper Base Platform**, ensuring stable and efficient handling of harvested **fruit**.
2. The **Harvesting Block**, attached to the rear of the base platform, featuring six horizontally shifting robotic manipulators equipped with **Computer Vision** for **fruit detection** and **harvesting**. These manipulators are mounted on a guided sliding frame, which moves vertically up and down to adjust the working area and optimize **harvesting efficiency**.

This advanced robotic **harvesting solution** maximizes productivity, efficiency, and cost-effectiveness, making it a game-changer for modern **fruit plantations**.

Features & Benefits

Fully Autonomous Harvesting System

The **Slopehelper Fruit Picker**, combined with the **Slopehelper Base Platform**, operates with complete **autonomy**, eliminating the need for an operator to manage **platform driving, supervision**, or **harvesting control**.

With this system, a single operator can oversee the entire plantation, only handling **agro bin loading** and unloading using a forklift. Instead of relying on a large **seasonal workforce**, just one operator per shift (two per 24 hours) is required to manage the entire field's **harvesting process**.

This revolutionary **automation** drastically reduces **labor dependency** and **costs**, ensures continuous **high-efficiency harvesting**, and maximizes **productivity** with minimal **human intervention**.

Autonomous Semi-Spherical Fruit Picking – From Apples to Oranges, Without Damage

The **Fruit Picker** is an **autonomous harvesting system** designed for damage-free collection of **semi-spherical fruits**, including **apples, peaches, pears, avocados, oranges, lemons**, and more.

Equipped with **Computer Vision** and six **human-hand-like ergonomic robotic manipulators**, the system precisely identifies, reaches, and picks fruit with optimal grip and movement control, ensuring a gentle harvesting process that prevents bruising or mechanical damage.

For **citrus harvesting**, the **Fruit Picker** features specialized gripping cups that execute a final rotational movement at the detachment stage, mimicking the natural **hand-picking process** and ensuring a clean, efficient **fruit separation** from the tree.

This advanced, **crop-adaptive technology** maximizes **harvest quality** and **efficiency**, making it an ideal solution for modern **high-density fruit orchards**.

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One Instrument Replacing a Team of Seasonal Workers

The **Fruit Picker** is a high-efficiency **robotic harvesting instrument** designed to replace a team of **8 seasonal workers**, significantly reducing **labor costs** and dependency on **human workforce availability**.

This system can harvest a full **agro bin** (approximately 450 kg of 80mm apples) in just 1 hour, ensuring unmatched **productivity**. While comparing to **human labor**, it's crucial to note that the **Slopehelper Base Platform** requires only 3 hours for recharging (provided a sufficiently powerful electric grid). Unlike human workers, **Fruit Picker** doesn't take breaks, smoke, eat, or get tired, operating effortlessly 16 out of 24 hours, which no human team can match.

This fully **autonomous**, high-performance **harvesting solution** ensures continuous operation, maximum **efficiency**, and a substantial reduction in **harvesting costs**, making it an indispensable tool for modern **fruit plantations**.

Operation in Both Modern Super-Intensive and Conventional Intensive Plantations

The **Fruit Picker** is designed for versatile **harvesting**, capable of operating in both **super-intensive** and **conventional intensive plantations**. Its advanced **Computer Vision**, optimized **manipulator length**, and **kinematic design** allow it to adapt seamlessly to different **orchard structures** without requiring special modifications to existing trees.

This means **fruit growers** can implement the **robotic system** without additional plantation adjustments, enabling effortless integration into current farming practices while maximizing **harvesting efficiency** across various **orchard types**.

Human-Hand-Like Ergonomics for Precision Picking

The **Fruit Picker** replicates the complex motor functions of the **human hand**, which requires at least six axes of movement for tasks like **harvesting citrus fruits**. Such precision is highly complex and can only be achieved through deep integration of advanced **electronics** and **kinematics**.

Leveraging 30 years of expertise in **defense technology** and special **telemechanics**, our team has developed a unique, highly reliable system using **Commercial Off-The-Shelf (COTS)** electronics and precision **kinematics**. The **Fruit Picker** incorporates nearly 50 axes, controlled by **electromechanical actuators** and high-performance **brushless motors**, ensuring seamless operation in rugged field environments.

This cutting-edge **robotic system** is designed for true **field conditions**, delivering unmatched accuracy, durability, and efficiency in automated **fruit harvesting**.

Fully Electromechanical Solution – No Hydraulic or Pneumatic Actuation

The **Fruit Picker**, like all **Slopehelper Agrosystem** instruments, operates exclusively on **electromechanical solutions**, without relying on **hydraulic** or **pneumatic actuators**. Unlike many startup-developed **apple-picking prototypes** that still use **hydraulics** or **pneumatics**, the **Slopehelper Fruit Picker** is engineered for **maximum reliability** and **energy efficiency**.

By eliminating **fluid-based systems**, this **robotic harvester** offers:

- **Higher durability** – No risk of leaks, pressure failures, or maintenance-intensive components.
- **Superior energy efficiency** – Optimized **power consumption**, extending operational runtime.
- **Precision and control** – Smooth, accurate movements that replicate **human-like picking actions** without mechanical delays.

This robust **electromechanical design** ensures the **Fruit Picker** is a fully **field-ready**, highly **efficient**, and long-lasting solution for modern **fruit harvesting**.

Adaptation for Operation on Slippery Terrain

The **Fruit Picker** is specifically designed for stable and precise operation on **slippery surfaces**. Special **actuators** dynamically adjust the **manipulator frame inclination**, ensuring that the **robotic arms** remain perfectly aligned with the **green fence** and **crop**, regardless of terrain conditions.

Additionally, the self-stabilizing **cargo platform** of the **Slopehelper** ensures that the **agro bin** remains in a constant **horizontal position**, preventing harvested **fruit** from shifting or sustaining damage due to uneven or slippery terrain.

This advanced **terrain-adaptive technology** guarantees **safe, efficient**, and **damage-free harvesting**, even in challenging field conditions.

Precision Picking with Color and Size Selection

In **fruit harvesting, selective picking** is crucial to ensure that only fully ripened, market-ready fruits are collected. Unlike **seasonal workers**, who may lack consistency and responsibility for plantation quality, the **Slopehelper Fruit Picker** guarantees 100% accuracy and reliability in its harvesting process.

Equipped with **Computer Vision-based color gradation** and **laser-net size measurement**, the system ensures that only fruits meeting the optimal **ripeness** and **size criteria** are harvested. This **automated selection process** allows plantation owners to:

- Maximize **profitability** by selling only the highest-grade produce.
- Avoid **premature harvesting**, ensuring fruits reach full market value.
- Enhance overall **plantation efficiency**, reducing post-harvest sorting efforts.

By combining **AI-driven precision** and **automation**, the **Slopehelper Fruit Picker** revolutionizes **orchard management**, delivering consistent quality and increased financial returns.

Technical Specifications

DIMENSIONS	VALUE
Height	2750 mm
Length	5200 mm
Width	1750 mm
Weight of attachment	1200 kg
Weight with installed attachment	3100 kg

WORKING DIMENSIONS	VALUE
Maximum height of harvesting	3500 mm
Minimum height of harvesting	650 mm
Maximum depth of harvesting	400 mm
Maximum slope angle	10°
Number of hands	6 (3 lines with 2 hands on each)
Picking speed	2500 pcs/h
Fruit size	40-130 mm
Operation speed	2 km/h

Technical Specifications

GENERAL SPECIFICATIONS	VALUE
Compatibility	SH.056 Slopehelper
Drive method	Conveyor Belt
Number of belts	2
Motor	Brushless motor - BLDC (stepper)