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FULLY MECHANIZED RICE AND WHEAT PRODUCTION WITH A FOCUS ON LOSS REDUCTION

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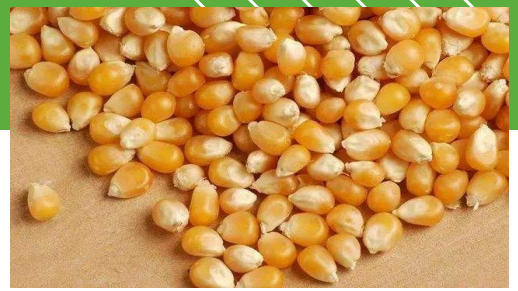
PART.03



Precision Seeding Technology

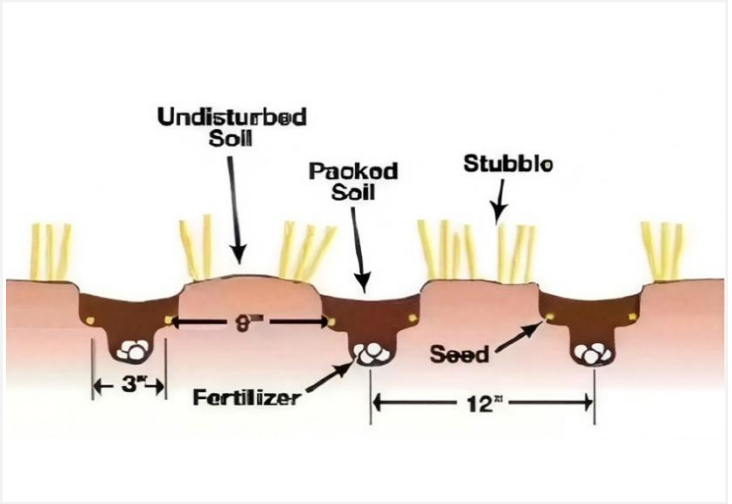
Key Objectives and Measures of Precision Sowing Technology

Primary Goal

- Achieve "**uniform and complete seedling emergence in one sowing**".

Four Key Measures

- **Precise seed quality control**-ideal seeds.
- **Optimized soil conditions**-ideal seedbed.
- **Accurate sowing depth and spacing**-ideal seed placement.
- **Proper temperature and moisture management**-ideal environment.



Integrated Benefits

- Uniform germination and emergence.
- Efficient seed utilization.
- Reduced resource waste.
- Improved overall crop quality.

Sowing Position Needs to Be Precisely Controlled

Fundamental Requirement

- **Precise control of sowing position** to ensure uniform emergence and good growth.

Traditional Limitations

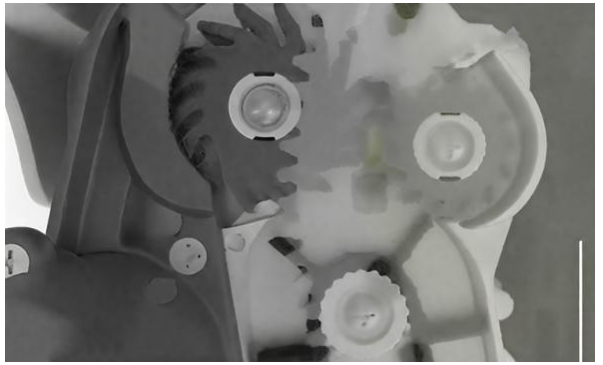
- **Spring-based depth control** of seeding susceptible to soil hardness/topography.
- **Unstable sowing depth**.

Technological Upgrade

- Upgraded control device to electro-**hydraulic control**.
- Acts as a **"smart brain" on the seeder to** automatically adjusts seeding depth based on soil conditions.
- Ensures **stable seeding depth**.

Hydraulic Pressure Control

Pneumatic Downforce Control



Precision Seeding

Sowing Position Needs to Be Precisely Controlled

Additional Innovation

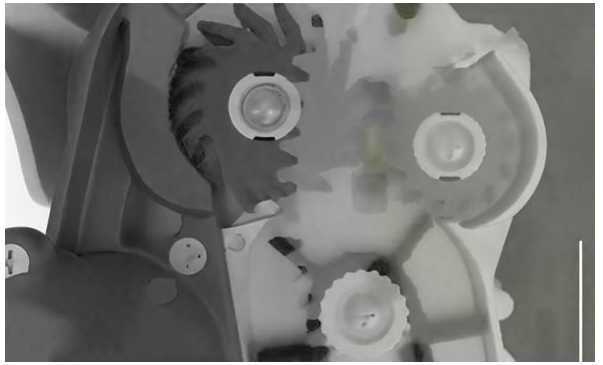
- Incorporates **precise seed-dropping technology** that functions accurately **even at speeds >10 km/h**.
- Ensures **uniform seed spacing** and **accurate sowing position.**

Integrated Advantages

- **Faster and more accurate sowing**.
- Meets the needs of modern agriculture for **efficient**, **high-quality planting**.

Hydraulic Pressure Control

Pneumatic Downforce Control



Precision Seeding

Seeding Quality Monitoring

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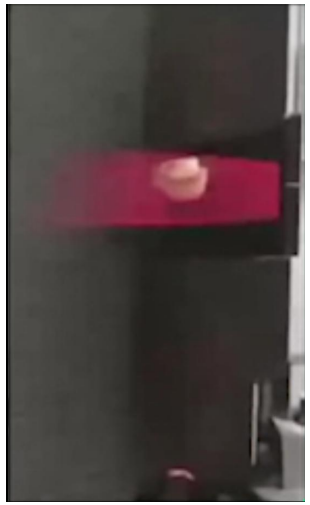
Photoelectric-based Sensor

- **Captures real-time data** of seed position, spacing, and sowing depth.
- **Free from dust interference** in the field.
- **Accurately detects** sowing uniformity and missed seeds.
- Transmit the data to the **intelligent system for analysis**.

Automatic Control System

- **Remotely set sowing parameter** through mobiles/computers.
- **Automatically plan roots** according to **GPS navigation** to ensure **the accurate operation of the seeder**.
- **Displays key indicators in real time**.
- **Finds problems and traces the whole process**.
- Achieves **efficient and accurate sowing**.



Sowing Quality Monitoring

Seeding Quality Monitoring

Seed Metering Device

Reliable Performance

- **99% pass rate** ensuring sowing consistency.

High Efficiency

- **36m working width** with **16km/h operational speed**.

Accurate Control

- **Millimeter-level precise control** of sowing depth and plant spacing.

Intelligent Monitoring System

- **Visual parameter setting**.
- **Real-time quality monitoring** of sowing rate, missed sowing rate, etc..

Full Traceability

- Ensures accurate, efficient, and fully traceable sowing operations.

Precision Planting's Seeder Products

Smart Variable-Rate Control

- Dynamically adjusts **sowing and fertilizer application rates**.
- Real-time monitoring of **soil organic matter**, **temperature**, **humidity** and **residues**.
- Enables **optimized variable operations**.

Precision Seeding Control

- Utilizes **high-speed, precise seeding systems**.
- Employs **precise monomer pressure control**.
- Ensures **consistent sowing depth** and **plant spacing**.

Agronomic Performance

- Improved **seed germination rates**.
- Enhances **uniformity of seedling emergence** in the field.

Industry Impact

- Advancing precision agriculture toward **greater intelligence and efficiency**.

GPS-SWITCH Seeding Single-row Control Technology

Single-Row Smart Control

- **Automatically monitors** the **sown area** through **GPS system** → **generates crop distribution information map** (population distribution + individual location).
- Realizes **intelligent planning** of **seeding path** and **accurate avoidance of overlapping**.
- Ensures **uniform single-row seeding**, **optimized crop spatial distribution**, and **data-based management support for precision agriculture**.

Key Technologies of Precision Variable Seeding and Fertilization

- **Precision Actuation**: Hydraulic drive precision variable seeding and fertilizer application.
- **Adaptive Control**: Adaptive control and precise adjustment of sowing rate.
- **Navi-Monitoring**: GPS positioning and automatic navigation, and real-time monitoring technology of operation quality and the status of machinery.

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Smart Wheat Farming Technology Supported by the Beidou Navigation System

Core Technology

- Enables **intelligent management of** the **entire wheat production process** → supported by **high precision (centimeter level) positioning**.

Functional Applications

- Automatic navigation and driving.
- Precision Sowing.
- Variable-rate Fertilization.
- Plant Protection.

Benefits

- Optimizes efficiency and resource utilization.
- Improves wheat yield and quality.
- Promotes the "unmanned farm" model.

Supporting Technologies

- Drone monitoring and big data analysis.

Pneumatic Single-Seed Precision Sowing Technology

Working principle

- Airflow based seed agitation device → optimized seed conditions → enhanced seed flow + reduced inter seed interactions → expanded effective seed filling range.

Supporting system

- High-precision air-suction seed metering system.

Technical effects

- Enable **accurate single-seed sowing** and improve **operational efficiency** and **sowing uniformity**.

Precision Seeding Technology

Development direction

- High-speed sowing and dense cultivation.

Improvement methods

- Improve **operation efficiency and accuracy** by **optimizing key indicators** such as the layout of seeding holes, sowing parameters, and positive pressure.
- Develop **multi-type seeding components** to adapt to different **crop varieties** and **cultivation modes**.

Cultivation effect

- Significantly **increase planting density** (maize **82,500 plants/ha**, soybean **375,000 plants/ha**).

Operation results

- Over **95%** pass rate at a high speed of **12 km/h**.

Final goal

- Achieve **efficient coordination** between **high and stable yield** and **mechanization**, promoting **agricultural intensification**.

Zero-Tillage Clean Area Seeding Technology

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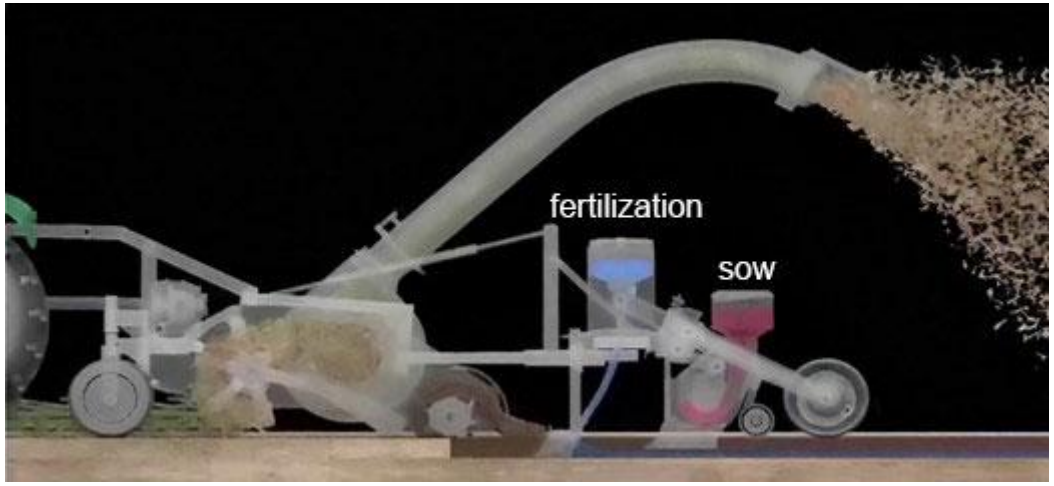

Technology type

- A **conservation tillage** technology that uses **direct seeding on untilled soil**.

Key Components and Operation

- Uses a **belt cleaning** device (e.g., rotary tillage knife or stubble removal unit) to **remove weeds and residues** from the **seeding belt**.

Benefits

- Preserves **soil moisture**, **resists erosion**, and promotes **rapid seedling emergence**.

Operational and Environmental Advantages

- **Reduces soil disturbance** and **lowers operating costs**.
- Integrates with **precision fertilization** and **plant protection**.
- Improves **resource use efficiency** and promotes **sustainable agricultural development**.

Direct Seeding Technology of Paddy Rice

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Operation method

- **Eliminates the seedling production** and **transplanting stages** with the advantages of **labor and cost saving**, **high efficiency** and **convenience**.

Applicable areas

- Areas with **favorable climatic conditions** including **adequate water**, **suitable temperature and light**, and **a long growing season**.

Technology requirements

- Needs to be supported by **precision sowing**, **effective weed control**, and **proper water and fertilizer management** to ensure yield and quality.

Model characteristics

- A classic mode combining simplified planting with mechanization.

Direct Seeding Technology of Paddy Rice

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Key Risks

- **Variety limitation**
  Cropping season + **growth period** → consideration of **early maturity** + **stress resistance**.
- **High land prep standards**
  Difficulty achieving a flat, **even field** → **uneven seedling emergence**.
- **Weather sensitivity**
  Unfavorable weather conditions → **unstable seedling establishment** → **difficult to ensure uniform** + **vigorous seedling stands**.
- **Weed and weedy rice control**
  Requires precise herbicide application techniques.
- **Late-stage issues**
  Early senescence and lodging reduce yield stability.

Solutions

Integrated approach: Variety improvement, precision sowing, field management, and mechanized support.

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Synchronized Furrow-Opening and Ridge-Forming Precision Hill-Drop Seeding Technology for Direct-Seeded Rice

Operation method

- Integrates **mechanized furrowing**, **ridging**, **and precise hill seeding** into a **single operation**.

Technical benefits

- Reduces water usage by **30%** and methane emissions by **10%**.
- Improves **water use efficiency** and lowers **greenhouse gas emissions** in the field.

Technical status

- A key technology for **simplified cultivation** and **environmentally friendly** agriculture.

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Large-Width Precision Water Direct Seeding Machine for Rice

Technology Features

- **Electric-driven seed metering:** Enables **stepless seeding rate adjustment** via **intelligent control**, with **real-time ground wheel monitoring** for uniform sowing.
- **Precision seeding: Online quality monitoring** + **jet-insertion technology** for accurate seed placement.

Operational Benefits

- **Integrated process:** Simultaneous **furrow opening & wheel track covering** improves **efficiency**.
- **Key outcomes:** Enhances **water seeding accuracy** and **seedling establishment rate**.

Drone Sowing Technology for Paddy Rice

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Technical features: Flexibly Adapting to Diverse Field Conditions

Orderly Strip Sowing:
- Plants **8 rows at a time** with **2.7 meters row spacing**, suitable for **neatly arranged fields**.

Wide-Spread Sowing:
- Covers **5 - 10 meters in width** per pass, ideal for **complex terrains** or **large-scale planting**.

Adjustable Row Spacing:
- Row spacing can be freely adjusted between **20 - 30 cm** to adapt to different **varieties** and **planting densities**.

Drone Sowing Technology for Paddy Rice

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Technical advantages

- **Highly efficient**, capable of sowing **over 30 mu (approximately 2 hectares) per hour**.
- Suitable for **hilly**, **mountainous areas**, or **fragmented fields**, able to **bypass obstacles**.
- **Eliminates the need for seedling production and transplanting**, supporting **simplified field management** and **large-scale operations**.

Technical significance

- Promotes the development of smart agriculture, making farming more scientific and efficient.

“Wheat Furrow” Rice Wet Planting Technology

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- **Concept Origin**
  - Inspired by wheat ridge-furrow cultivation.
  - Applies ridge planting and furrow irrigation to rice.
- **Water & Seedling Benefits**
  - Reduces water use by >30% vs. traditional flood irrigation.
  - Accelerates soil warming; enhances seedling vigor.
  - Enables precise water control.
- **Field Structure & Irrigation**
  - Forms “ridge-furrow”structure via mechanized ditching and ridge formation.
  - Moist irrigation management reduces ineffective water consumption.

- **Soil, Root & Environment**
  - Inhibits methane emissions.
  - Improves soil permeability.
  - Promotes root development.
- **Suitability & Value**
  - Beneficial in water shortage or arid regions.
  - Offers ecological benefits and stable yields.

Vacuum Drum-Type Rice Seedling Sowing Assembly Line

Core Technology

- Achieves single-grain precision sowing using **negative pressure adsorption**.
- Drum-type trays + airflow-assisted seed filling → **uniform seeding and spacing**.
- Integrated automation → **soil spreading, watering, soil covering** → standardized seedling production.

Technical Advantages

- Improves **seedling quality** and **production efficiency**.
- Serves as a core technology for **factory-style seedling cultivation** and **mechanized transplanting**.

Supporting Technologies

- **Seed handling:** Composite vibration filling, pneumatic seed cleaning, balanced air distribution.
- **Smart control:** Integrated **multi-process control system**.
- **Seedling strengthening: Stacked dark-treatment** for cultivating **strong**, **healthy seedlings**.

Carpet Seedling Mechanical Transplanting Technology

Technical Features

- **Mature & reliable: Officially promoted** by agricultural authorities with stable **high-yield performance** and **low operational risk**.
- **Adaptive cultivation:** Adopts **diversified seedling cultivation methods** tailored to **local conditions**, adjusting practices based on **variety**, **climate**, and **seedling traits**.

Supporting Machinery

- Hydraulic contour-following.
- Self-balancing systems.
- Four-wheel drive technology.

Core Advantages

- Consistent transplanting depth and efficient operation.
- Enhances the efficiency of mechanized transplanting and rice yield stability.

Roll-Seedling Rice Cultivation Technology

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Technical Principle

- **Roll-type cultivation:** Mechanically sows rice seeds onto a cylindrical carrier to form roll-type seedlings.

Core Advantages

- Reduces labor and cost.
- Improves seedlings quality.
- Ease of transplanting.

Large-Seedling Rice Transplanter

Technical Innovation

- **"Kidney-shaped" trajectory:** Raises static transplanting path height from **280 mm** to **320 mm**, significantly enlarging the **dynamic trajectory's clearance space**.
- **Tall seedling adaptation:** Accommodates seedling heights of up to **40 cm** (vs. **25 cm** limit).

Performance Advantages

- Solves transplanting issues of tall/soft-tray seedlings.
- Reduces seedling damage and missed planting.
- Improves transplanting efficiency and field establishment quality.
- Supports the advancement of mechanized rice farming toward deep planting of strong seedlings.

Optimal Seedling Traits

- Around 35 days old.
- Upright, vibrant green leaves.
- Well-developed and densely entangled roots.
- Sturdy, resilient stems.

Rice Transplanter with Synchronized Furrow-Opening Device

Technical Innovation

- Combines transplanting with the excavation of field drainage or irrigation furrows in one operation.

Key Features

- Special attachment creates drainage/irrigation furrows between seedling rows.
- Follows pre-set specifications for spacing, depth, and width.

Benefits

- **Efficiency:** Improves field operation efficiency.
- **Soil Health:** Reduces machine passes, minimizing soil compaction and damage.
- **Water & Nutrient Management:** Enhances field water and nutrient utilization.

Impact

- Significant advancement in modern, mechanized, and precision agriculture.

Pot Seedling Mechanical Transplanting

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Technical Features

- Uses specialized machinery to transplant pot-or plug-grown seedlings directly into the field.

Core Advantages

- High efficiency and consistent transplanting quality.
- Reduced labor intensity.
- Enhanced crop stress resistance.

Limitations

- Higher equipment costs.
- Requires high-quality seedlings.

Core Focus

- Protects the integrity of root system.
- Improves transplanting efficiency and survival rates.
- Ensures precise spacing and depth for standardized planting.

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Clamp-and-Pull Type Pot Seedling Transplanter

Technology Highlights

- **Wide-Span Orderly Throwing:** High-efficiency mechanized transplanting method for even, orderly pot seedling distribution across a wide working width.
- **Core Mechanism:** Seedling-throwing mechanism for accurate placement at preset row spacing and density.
- **Operation Mode:** Wide-span (e.g., 2 - 4 rows simultaneously) for efficient, low-damage transplanting.

Benefits

- **Seedling Quality:** Preserves root integrity and maintains seedlings upright.
- **Farming Scale:** Well-suited for large-scale farming.
- **Economic Impact:** Improves efficiency, cuts labor costs.
- **Innovation:** Important advancement in pot seedling transplanting mechanization.