Central Agricultural
Broadcasting and Television School
中央农业广播电视学校

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

CONTENTS

Central Agricultural Broadcasting and Television School
中央农业广播电视学校

Central Agricultural
Broadcasting and Television School
中央农业广播电视学校

PART.01

Loss Reduction in Agricultural Production

China's Post-Harvest Grain Loss Overview

- China's Grain Production Capacity
  - Annual output exceeds **600 million tons** of major crops (rice, wheat, maize).
- Post-Harvest Loss Situation
  - Current loss rate: **15%** of total production.
  - International comparison: 3× higher than global standard (**5%**).

Main Causes of Post-Harvest Losses

- **Issues and Causes**
  - **Mildew, sprouting**, and **spoilage** caused by humid climates.
  - **Delayed drying** and excessive **moisture** during storage.
  - **Drying process losses**.
- **Scale of Losses**
  - About **5%** of total post-harvest losses.
  - In years with **extreme weather**, losses are even more severe.
- **Need for Action**
  - Adopt **post-harvest loss reduction technologies**.
  - Improve related **facilities**.

Key Measures for Loss Reduction

- Build **high-standard farmland** resilient to **droughts and floods.**
- Apply **precision sowing technologies** for **efficient resource use**.
- Improve **mechanization** and **standardization** to boost **productivity**.
- Strengthen **disaster prevention** and **resilience**.

Integrate quality farmland, improved seeds, sound management systems, advanced machinery, and best practices to reduce losses throughout the production process.

Stages in Loss Reduction

1. Fine tillage and land preparation
2. Precision sowing
3. Field management
4. Loss reduction at harvesting stages
5. Drying and storage

1. Fine Tillage and Land Preparation

Central Agricultural Broadcasting and Television School
中央农业广播电视学校

Prepare quality seedbeds, boost emergence rate and uniformity

- **Plow** to break **hard soil,** enhance **aeration**, expand **root space**.
- **Level land** via **harrowing/rolling**, ensure uniform **sowing depth**.
- Apply **basal fertilizers** per **soil tests**, aid post-germination **absorption**.

Reduce weeds/pests/diseases, secure uniform emergence and stable yields.

Plowing

Land leveling

Basal fertilizers

2. Precision Sowing

Optimal plant spacing and vigorous individual plants

- **Precision seeding (single-seed sowing):**

  Prevent **seed waste** and **seedling overcrowding**.

- **Proper spacing:**

  Ensure **light, water** and **nutrient supply**, boost **robust growth**, reduce **non-productive plants**.

- **Advantages:**

  Cut **thinning labor**, lower costs, simplify **field management**.

3. Field Management

- **Water:**

  Timely **irrigation/drainage** to maintain **moisture**, prevent **drought/waterlogging**.

- **Fertilizer:**

  Staged **top-dressing**; early **nitrogen** for **growth**, late **phosphorus/potassium** for **resilience** and **yield**.

- **Pesticides:**

  Rational use with controlled **timing**, **dosage** and **safety interval**; avoid **harm/residues**.

- **Diseases, insects and weeds:**

  Integrated control (rotation, biological/mechanical methods) to reduce **chemicals**.

- **Maturity uniformity:**

  Standardized management for consistent **growth/maturity**; facilitate **mechanized harvesting**.

4. Loss Reduction at Harvesting Stages

Central Agricultural Broadcasting and Television School
中央农业广播电视学校

Harvesting:

- Choose **proper time** to avoid **shattering/ quality decline**.
- Use **mechanization** to boost **efficiency** and reduce **losses**.

Threshing:

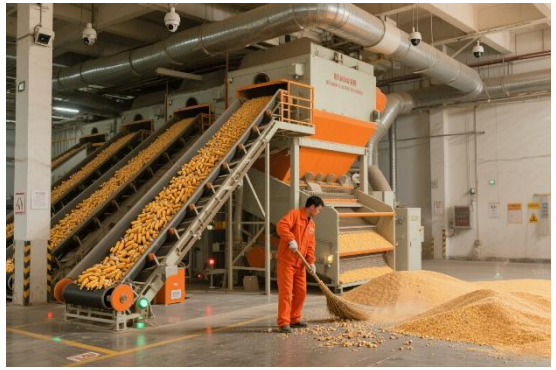
- Adjust **machine parameters** (**speed, clearance**).
- Ensure complete **kernel separation**.
- Avoid **over-breakage**.

Cleaning:

- Remove **impurities** via **sieves/blowers.**
- Improve **grain purity**.

Straw shredding:

- **Shred** and return **straw** to field.
- Reduce **straw residue**.
- Increase **soil organic matter**.
- Improve **soil structure**.



5. Drying and Storage

- **Drying:**

  Reduce **moisture** to **safe storage levels** (e.g., **wheat ≤12.5%**) via **mechanical/natural drying**; prevent **mildew** and **pests**.

- **Processing:**

  Conduct initial **processing** (**peeling, grinding, oil extraction**, etc.) by **purpose**; increase **added value**.

- **Grading:**

  Sort by **size**, **weight**, **color**, etc.; ensure **uniform specifications**, meet **diverse market demands**.

- **Packaging:**

  Use **moisture/insect-proof materials** with **labels (origin, variety**, **weight**); facilitate **storage/transport**, enhance **competitiveness**.