

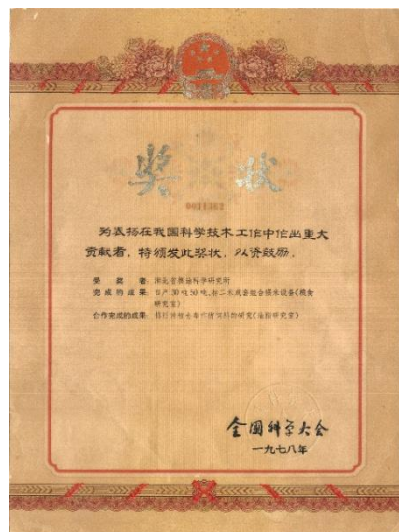
# Experience of storage facility construction in Africa



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# Achievement of China Grain Wuhan Sci. Res. & Design Insti.

- ◆ Specialize in the R & D of grain and oil seed processing and storage technology since 1964
- ◆ Standard
- ◆ Engineering & design & EPC/ MEC (> 5,000 sets)



# Achievement on Rice mills of China Grain Wuhan Sci. Res. & Design Insti.



# Achievement on Grain Storage & Logistics of China Grain Wuhan Sci. Res. & Design Insti.



**Storage**

**Logistics**

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- 1. Storage facility & tech. in China**
  - 2. Practice in Africa & some proposals**
  - 3. some suggestions for small farmers**

# 1. Storage facility & tech. in China

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## 1.1 warehouse or silos

1.1.1 for Grain **Reserve** (> 1 year)

1.1.2 for **process** enterprise (< 1 year)

## 1.2 technology

1.2.1 air-tight (control air flow)

1.2.2 low temperature (control temperature)

1.2.3 low O<sub>2</sub> (control air content)

# 1. Storage facility & tech. in China

## 1.1 warehouse or silos

### 1.1.1 for Grain **Reserve** (> 1 year)



high-large warehouse



multi-storied warehouse reinforced

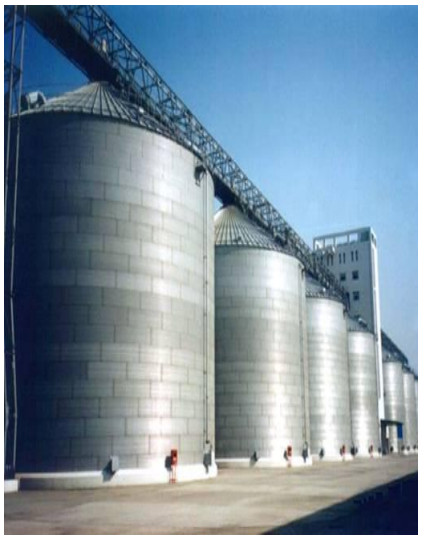


concrete squat silo

# 1. Storage facility & tech. in China

## 1.1 warehouse or silos

### 1.1.2 for **process** enterprise (< 1 year)



steel silo



steel silo(heat isolation)



brick-concrete silo



reinforced concrete silo



# 1. Storage facility & tech. in China

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## 1.2 technology

### 1.2.1 air-tight (control air flow)

prevent **moisture loss**,

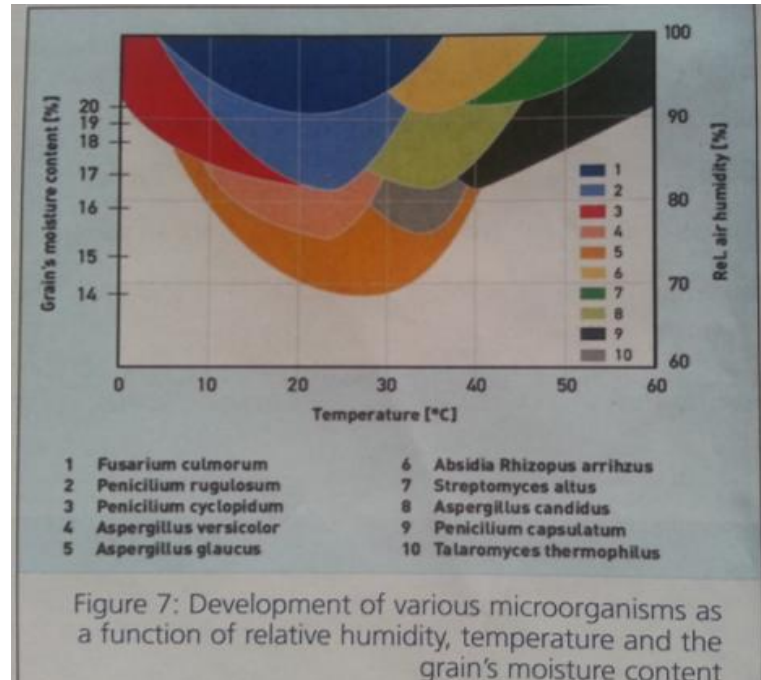
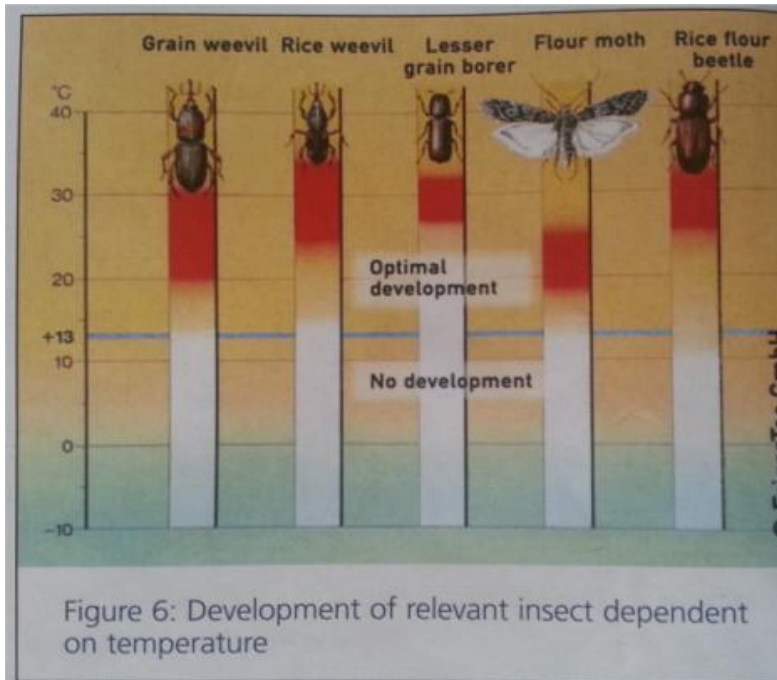
prevent **damaged by rats, bird, insect**

# 1. Storage facility & tech. in China

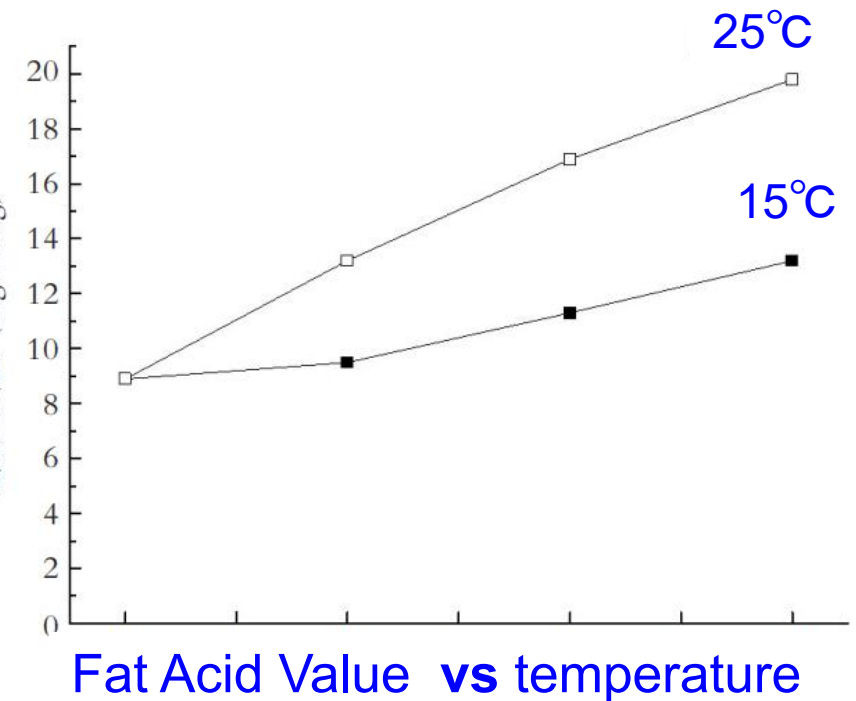
## 1.2 technology

### 1.2.2 low temp. storage

control insect, fungi & lower FAV



FAV



# 1. Storage facility & tech. in China

## 1.2 technology

### 1.2.2 low temp. storage

control insect, fungi & lower FAV



air tight + heat isolation + ventilation system / air conditioner / grain chiller

# 1. Storage facility & tech. in China

## 1.2 technology

### 1.2.2 low temp. storage

control insect, fungi & lower FAV



heat isolation+ ventilation system / air conditioner+ solar panels

# 1. Storage facility & tech. in China

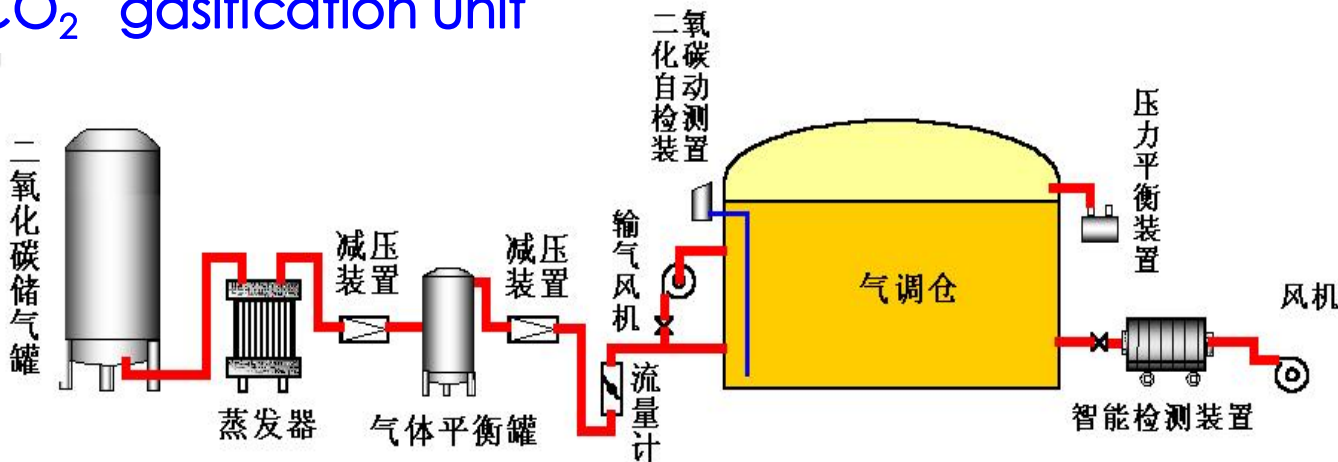
## 1.2 technology

### 1.2.2 low O<sub>2</sub> storage



CO<sub>2</sub> gasification unit

control insect & lower FAV



N<sub>2</sub> separator



CO<sub>2</sub> tank

# 2. Practice in Africa & some proposals

## 2.1 present situation & some proposals



wood roof warehouse  
Nigeria (2017)

vs



steel structure warehouse  
Somalia (last century)

# 2. Practice in Africa & some proposals

## 2.1 present situation & some proposals



VS



**steel silo**  
**Nigeria (2017)**

**brick silo**  
**Somalia (last century)**

**heat insulated steel silo**  
**Nigeria (2018)**

# 2. Practice in Africa & some proposals

## 2.1 present situation & some proposals



**heat insulated steel silos Nigeria (2018~2019)**



# 2. Practice in Africa & some proposals

## 2.1 present situation & some proposals



**heat insulated steel silos Nigeria (2018~2019)**

# 3. some suggestions for small farmers

## 3.1 small steel bin



VS



not good

small steel bin

# 3. some proposals for small farmers

## 3.2 drying mat



**Not good ! ! !  
drying on road or  
on ground**

**VS**



**on clean ground , use drying mat ✓  
turn frequently +use shed  
(avoid the hot sun)**

# 3. some proposals for small farmers

## 3.2 drying mat



**drying mat (made of bamboo, or PP)**

# 3. some proposals for small farmers

## 3.3 cleaning tools



hand sieve



hand grain blower

pre-cleaning before store is very important

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**Thank you!**  
**谢谢聆听!**

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