

# 建议 The Theme of my Proposal

to Mr. Premier

To Harness Exposed  
Farmland is the Key to  
Sandstorm Prevention

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# No.1 Conference Room, the State Council

- Premier Wen Jiabao invited 13 experts to view on sandstorm issue
- At the beginning of his speech, Premier Wen made a brilliant remark: sandstorm is a natural phenomenon. If we intend to control it according to the law of nature, we will accomplish our goal; If we go against the law of nature to harness it, the more investment we put in, the worse.

# Table of Content

- **1. Frequent attacks of sandstorm once again alarm us of ecological deterioration**
- **Exposed farmland is the major source of sand dirt**
- **The key to the prevention of sandstorm is to harness exposed farmland**

## Frequent attacks of sandstorm once again alarm us of ecological deterioration

### Characteristics of sandstorm in 2006 spring

- **Early happening:** the first large scale sandstorm weather began from March 9th,2006
- **Frequent happening:** up to April 18th, 10 sandstorms took place in the North of China, including 4 sand raisings and 6 sandstorms, 4 times more than the same period 2005.
- **Extensive influence:** the coverage included 13 provinces / districts with an area of about 3,040,000 square kilometers.
- **Heavy sandfall in the Capital Beijing:** 15grams on each square meter and a total of 3 million tons of dirt on the night of April 16th.

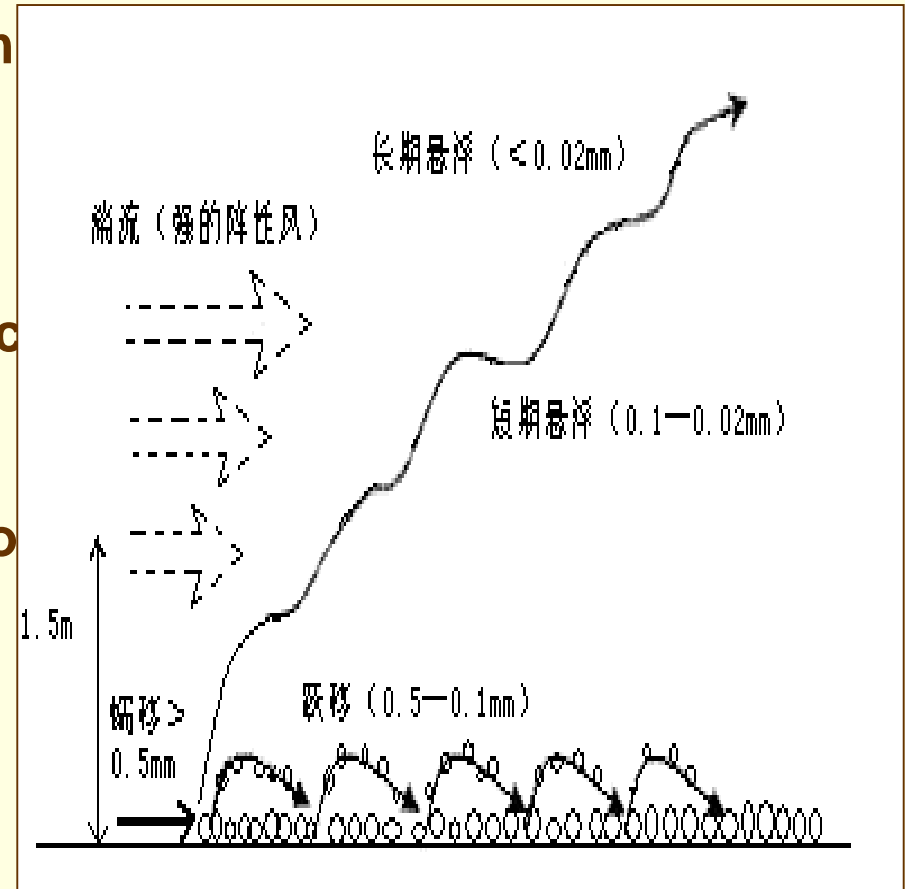
# Frequent attacks of sandstorm once again alarm us of ecological deterioration

## Damages and losses of 06 spring sandstorms

- Wreck infrastructure;
- Pollute the environment;
- Threaten people's health;
- Accelerate desertification of land;
- Negative international impact.

# 建议 II. Exposed Farmland is the Major Source of Sand and Dirt

- Three major factors to form sandstorm: strong wind, source of sand and dirt, unstable lower atmospheric layer
- Three movement patterns of sand grains :wriggling, leaping and suspending

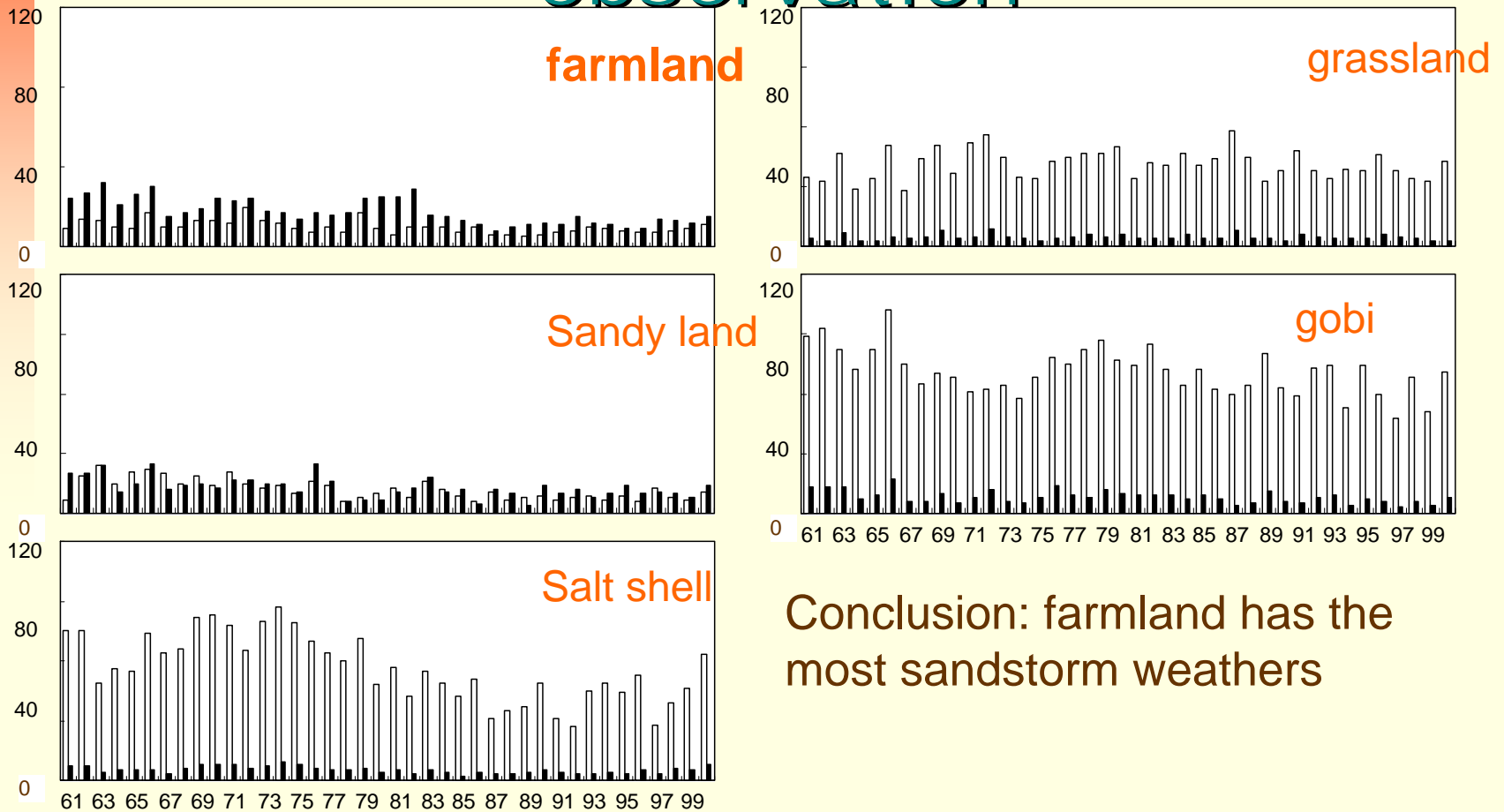


## II. Exposed Farmland is the Major Source of Sand and Dirt

### Major evidence of sand and dirt sources

- 40 years of orientation observation;
- Satellite remote sensing;
- Field gauge of different types of land surface;
- Wind tunnel simulation experiment
- Defining the degree of farmland loss.

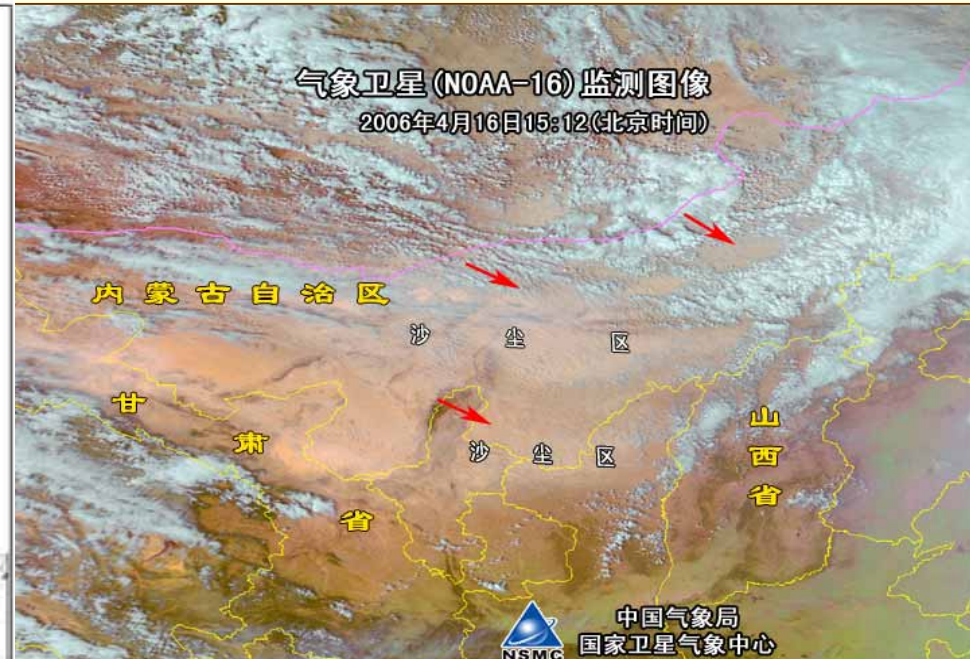
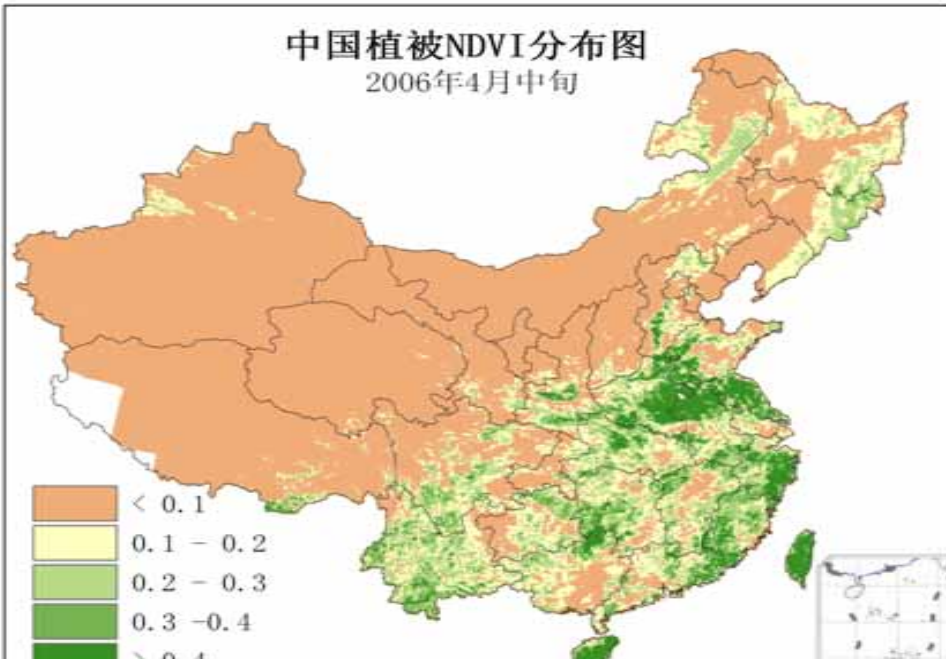
# 40 years of orientation observation



Conclusion: farmland has the most sandstorm weathers

Correlation between strong wind days of 5 types of land in 40 years (□) and sandstorm days (■)



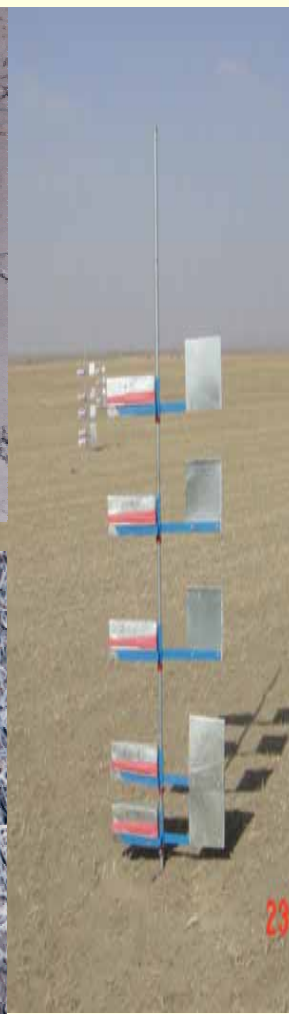
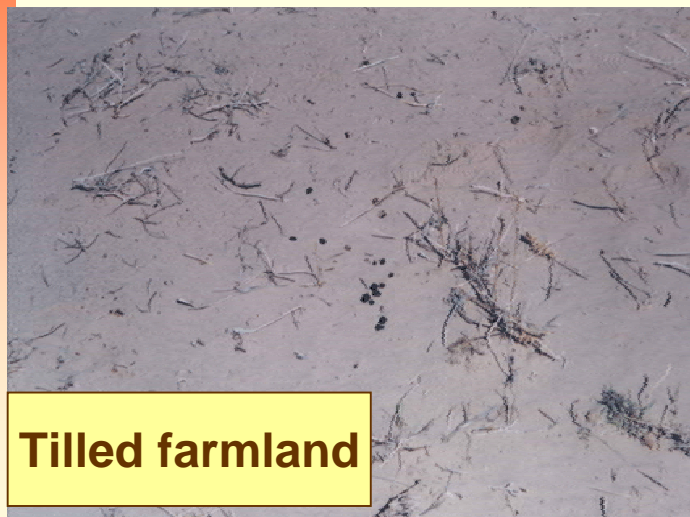


**Cloud atlas: China's plant coverage distribution in April and sand dirt distribution**

**Conclusion:** In spring of China's north, there are 720 million mu exposed farmland, and about half of grassland are degenerated.

Due to large area of exposed farmland, rich sand dirt complement into the sandstorm in its movement, which intensifies and expands the sandstorm.

# Field Gauge in Different Types of Land



Testing site: Square Blue Qi, Inner Mongolia

# Field Gauge in Different Types of Land

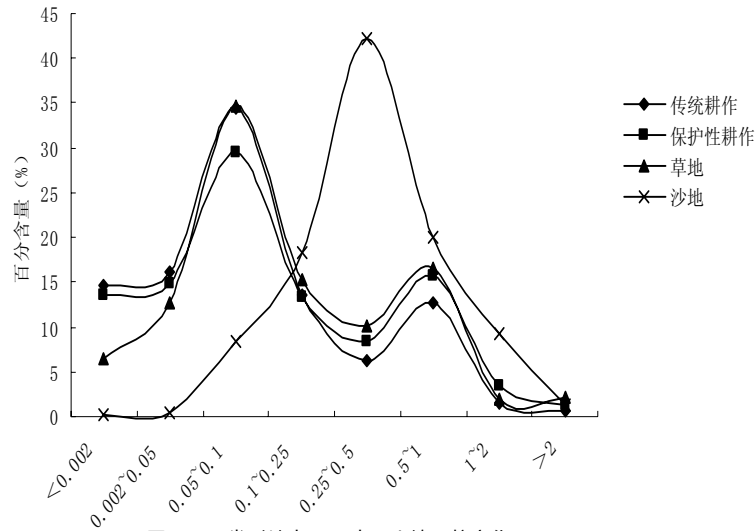
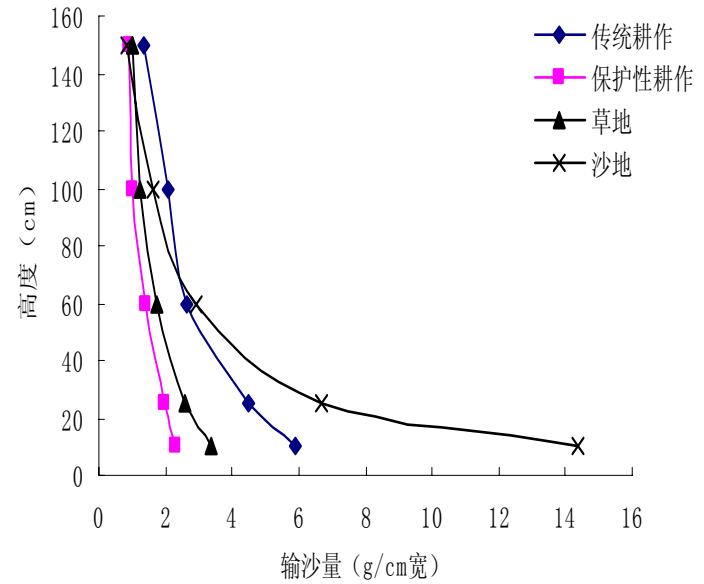


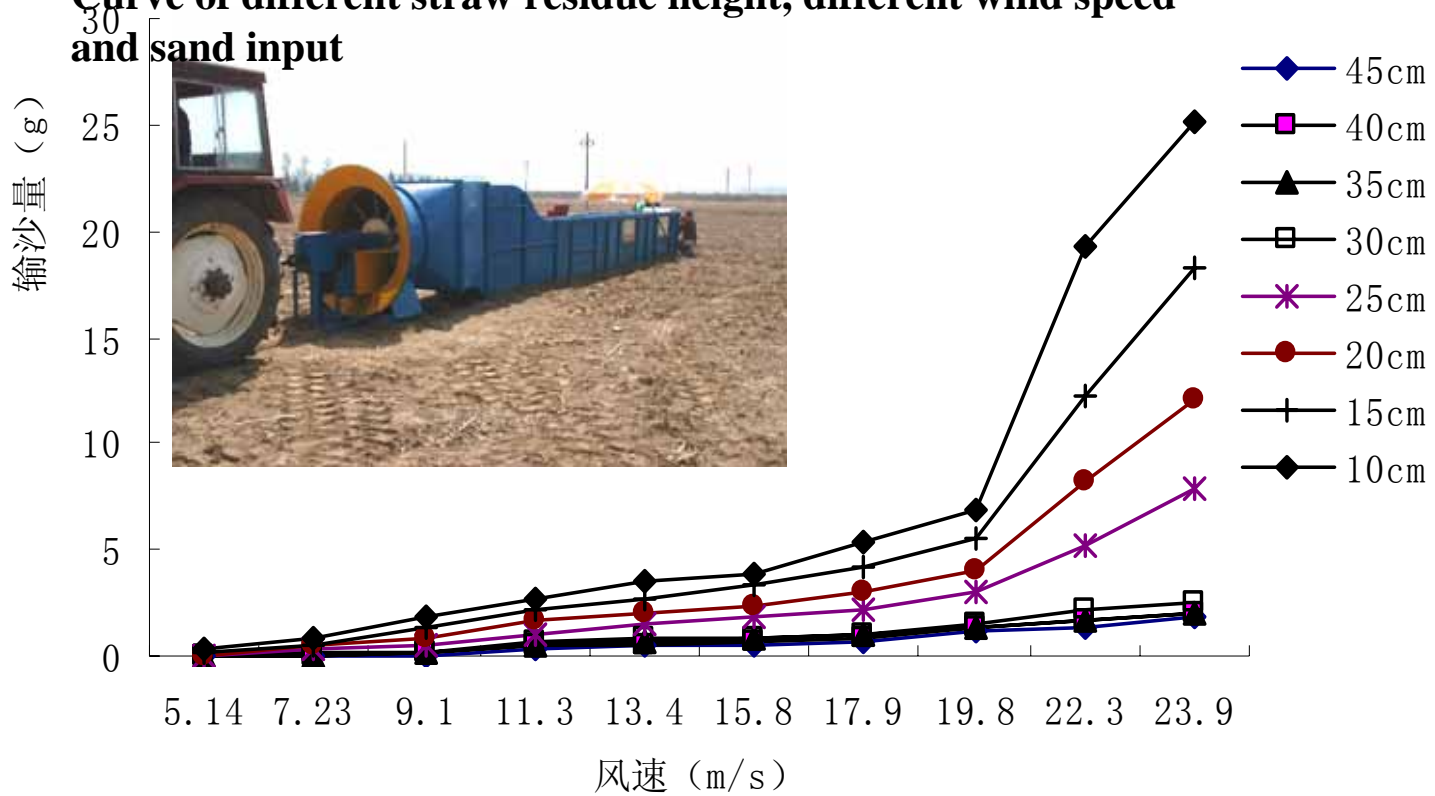
图4 不同类型地表0-3m表层土壤颗粒变化级 (mm)  
Fig.7 four types soil surface at 0-3cm percent of difference grain



**Conclusion:** there is little suspending grains in sandy land, grains which are smaller than 0.02mm accounts for 0.24%, while in farmland and grassland, suspending grains have biggest quantity, glutinous grains which are smaller than 0.02mm account for 14.65% in conventional tilled farmland, 13.59% in protective non-tilled farmland and 6.37% in grassland. Protective no-tilling has evident effect on the harness of sand by reducing more than 50% of wind erosion. 400 kg of coverage could reduce wind erosion

# Wind Tunnel Simulation Experiment

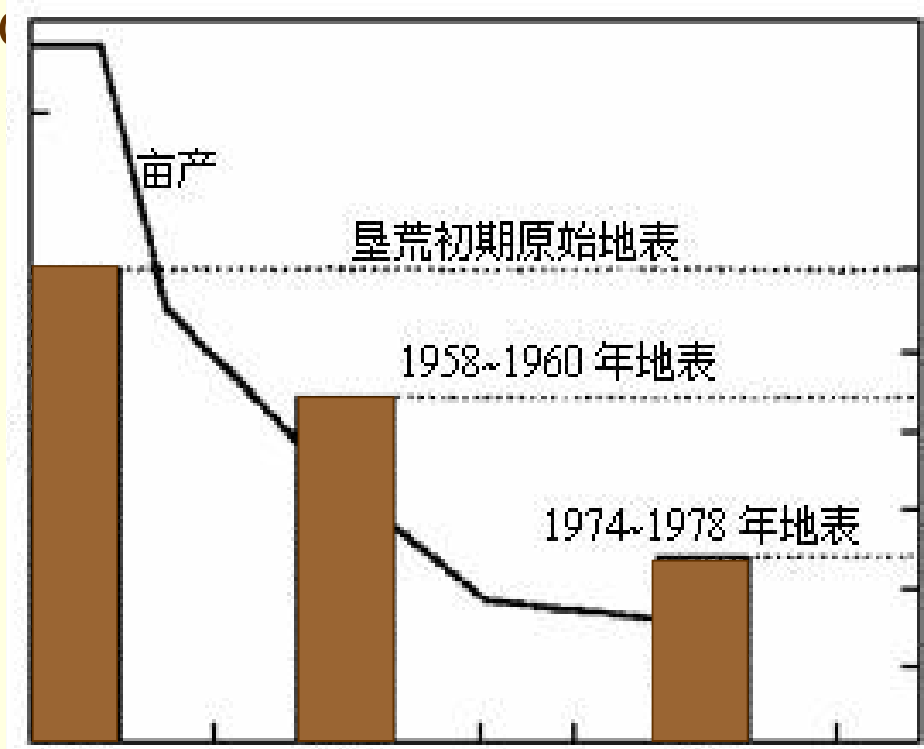
Curve of different straw residue height, different wind speed and sand input



**Conclusion: quantity of sand become smaller with the growing of the straw height, when the straw height exceed 30cm, the effect to prevent**

## Define the degree of farmland loss

- Each year 1cm of rich soil from tilling layer are blown away by wind in conventional tilled farmland



## III. The Key to Sandstorm Prevention is to Harness Exposed Farmland

- Principles:

1. **To build windbreak.** Planting trees and utilizing high-straw crops can effectively reduce the wind force directing onto the soil grains.

2. **To cover the farmland.** Capacity to resist wind erosion should be improved and soil grains movement restrained. Major measures to cover the farmland include: the advancement of protective no-tilling (to cover with straw residue), to reclaim grass from farmland (to cover with grass) and to move winter wheat northward (to cover with winter crops).

## Suggested Measures

- **1. To restructure farming composition**
- **2. To promote protective no-tilling**
- **3. To intensify grassland protection and building**

## To Restructure Farming Composition

- **To advance combined farming of crops and grass.**  
Cross planting and sowing and alternation of crops and grass.
- **To increase winter and spring farmland coverage.**  
Introduce over-the-winter crops (winter wheat, grass and Chinese herbals) into tilling system of the farmland.
- **To advance winter wheat shift project.**



## 2. To Advance Protective No-tilling

- **Technological highlights:** to retain straw stubble; to sow no-tilling; to integrate shallow tilling into weed killing.
- **Current foundation:** Our farming technicians have developed no-tilling sowing machines and cultivating technology suitable for China based on assimilation of overseas experience. In 2005 no-tilling was advanced in wind erosion area by 2 million mu.
- **Research focus:** to intensify research on high yield from no-tilling technology, combination of agricultural craft and machinery and to consummate regional no-tilling technological system.



# Series of maize no-tilling sowing machines



2 rows



3 rows



4 rows



4 rows



6 rows



# Series of maize no-tilling sowing machines



5 rows



6 rows



7 rows



9 rows



12 rows



## 3 Intensify grassland protection and building

- **Protect the current grassland:** to prohibit grassland cultivation, to restrain utmost carriage of animals and overloaded herding and to ban excessive exploration and excavation.
- **Improve patterns of pasteurizing:** to advance alternate pasture and penning herding and consolidate enclosed cultivation and artificial grassland building to recover grassland coverage and reduce the sources of sand and dirt.

# After Report

- Consensus was reached: what happened in Beijing is not storm of sand, but storm of dirt;
- The grains in the storm are mini grains;
- The mini grains come from exposed farmland;
- Active measures should be taken to harness exposed farmland.

Thank You

An aerial photograph of a vast, green agricultural field, possibly a cornfield, with a distinct row of trees or a path running through it. The sky is a pale, hazy blue. Overlaid on the scene is the text 'Thank You' in large, 3D, gold-colored letters. The letters have a slight shadow and are positioned in the center-right of the frame, appearing to float above the field.