

## Seedbed Preparation

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## Objectives

1. Today
  - a) Goals & basic types of seedbed preparation or management with examples
2. Tomorrow
  - a) Case studies

## Safe Sites are where

1. all requirements for germination and establishment are met;
2. hazards (predators, competitors, toxic substances, pathogens) are absent.

## Seedling Establishment

1. A function of the number of seeds in safe sites, rather than the total number of available seeds.
2. Planting techniques that maximize the abundance of safe sites and accurately place seed may be less expensive because they require less seed and reduce the risk of failure.

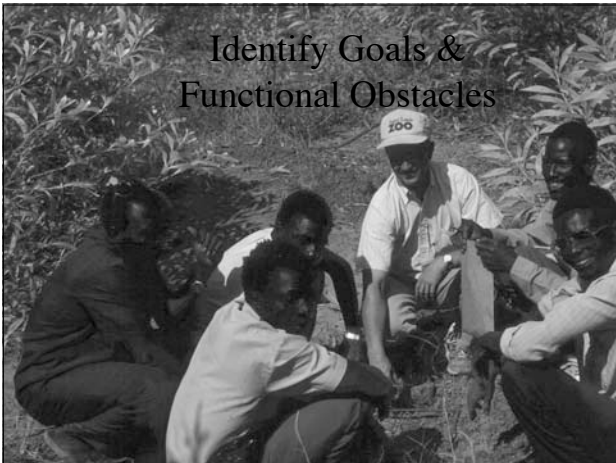
## Functional Ecosystem Processes

1. Hydrology
2. Nutrient Cycling
3. Energy capture & flows
4. And have proper micro-climate

No progress without first  
stabilizing soil resources



Identify Goals &  
Functional Obstacles



Understand what is possible



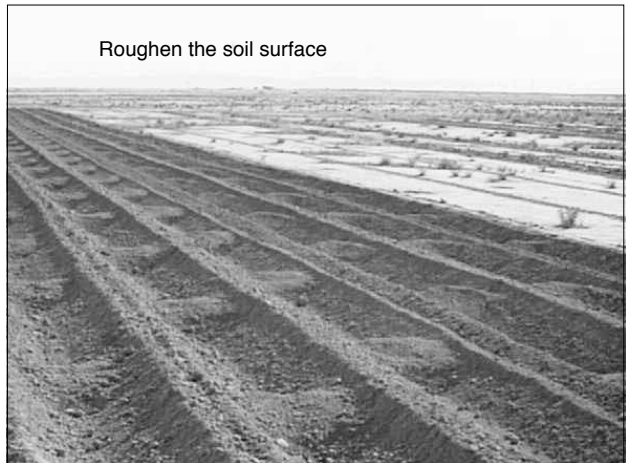
## Initial Emphasis on Process Repair

1. Site stability & erosion control
2. Hydrology
3. Nutrient cycling
4. Energy capture & transfer

## Hydrologic Process Repair



Roughen the soil surface





Shaanxi Province, China



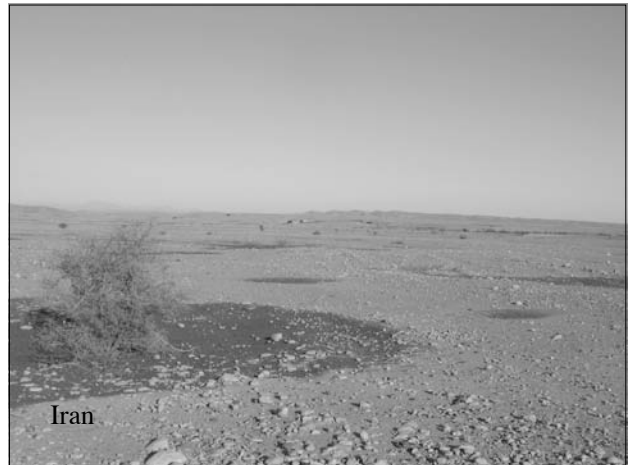
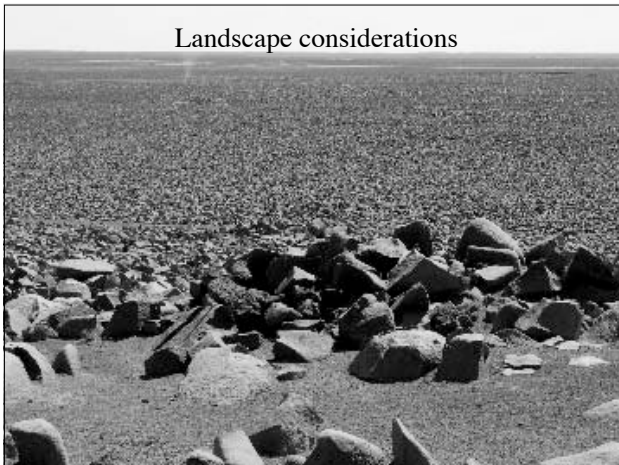
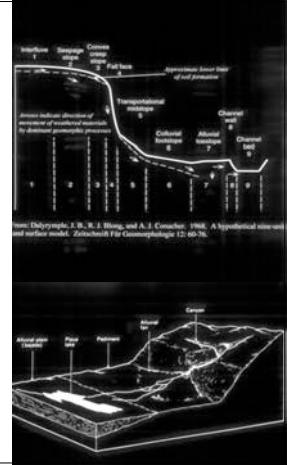
Niger

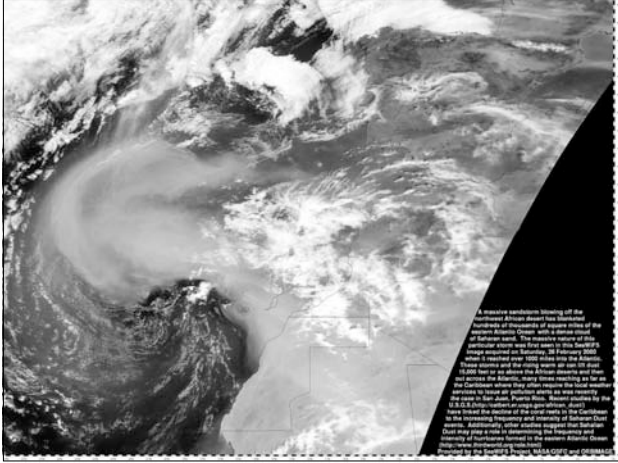




### Landform effects

1. Inherent differences in ability to capture and hold limiting resources
2. Vastly different restoration potentials







### Good Seedbeds should be

1. Firm enough to hold water near the surface and make it easier to control seeding depth.
2. Loose enough for good water infiltration.
3. Firm enough to improve soil to seed contact and support seeding equipment.

### The Ideal Seedbed for most species

1. Firm below and above seeding depth;
2. Composed of thoroughly tilled, friable soil;
3. Not cloddy or compacted;
4. No established weeds;
5. Few weed seeds; and
6. Moderate amounts of plant residue.

### Seedbed Management Strategies

1. Unassisted natural recovery
2. Assisted natural recovery
3. Artificially induced recovery



### Unassisted Natural Recovery

1. No seedbed modification
2. Reliance on natural seed dispersal mechanisms

### Assisted Natural Recovery

1. Selective seedbed modification
2. Reliance on natural seed dispersal mechanisms



### Artificially Induced Recovery

1. Selective seedbed modification
2. Artificial addition of selected plant materials

## Seedbed Preparation Methods

1. Mechanical and manual
2. Chemical
3. Fire-based
4. Biological (agronomic or successional)

## Mechanical Seedbed Preparation

1. Loosen compacted soils (surface and subsurface)
2. Roughen soil surface
3. Debris removal
4. Weed control



Cultivation generally increases seedling establishment, but may also increase erosion hazards and/or weed problems.



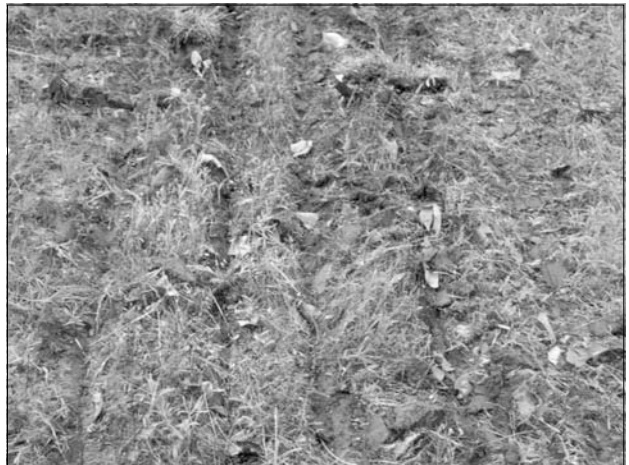
The most common problem with mechanically prepared seedbeds is a loose, soft seedbed.













## Burning Methods

1. Reduce litter to stimulate natural regeneration.
2. Debris removal (herbaceous or woody) to improve equipment operation.



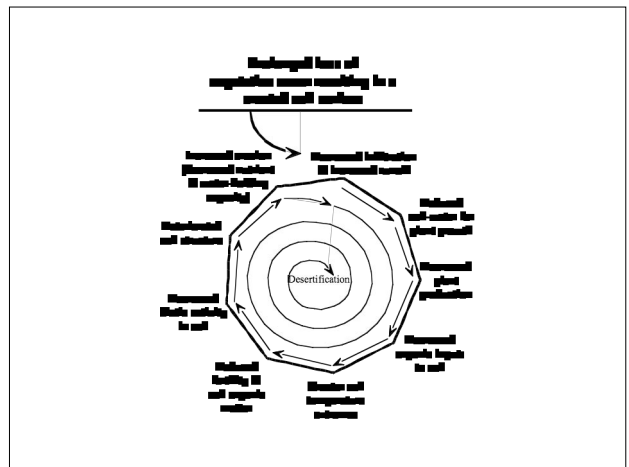




## Biological Methods

1. Nurse plants - grow with desired species to improve conditions.
2. Preparatory crops - grown prior to planting of desired species to improve conditions.







Northern China