

Use the Course Companion blue text book (Science office book shelf).

1. Read fig 12.3 p230 – Gersmehl model, and complete the purple shaded box “Review” tasks 1, 2 & 3 [IN FULL] p.239 and 240.

*This is not new material (we covered this in the Biome Topic 2.4), yet it also connects to the syllabus topic 3.4 Soil System, which we are now starting.*

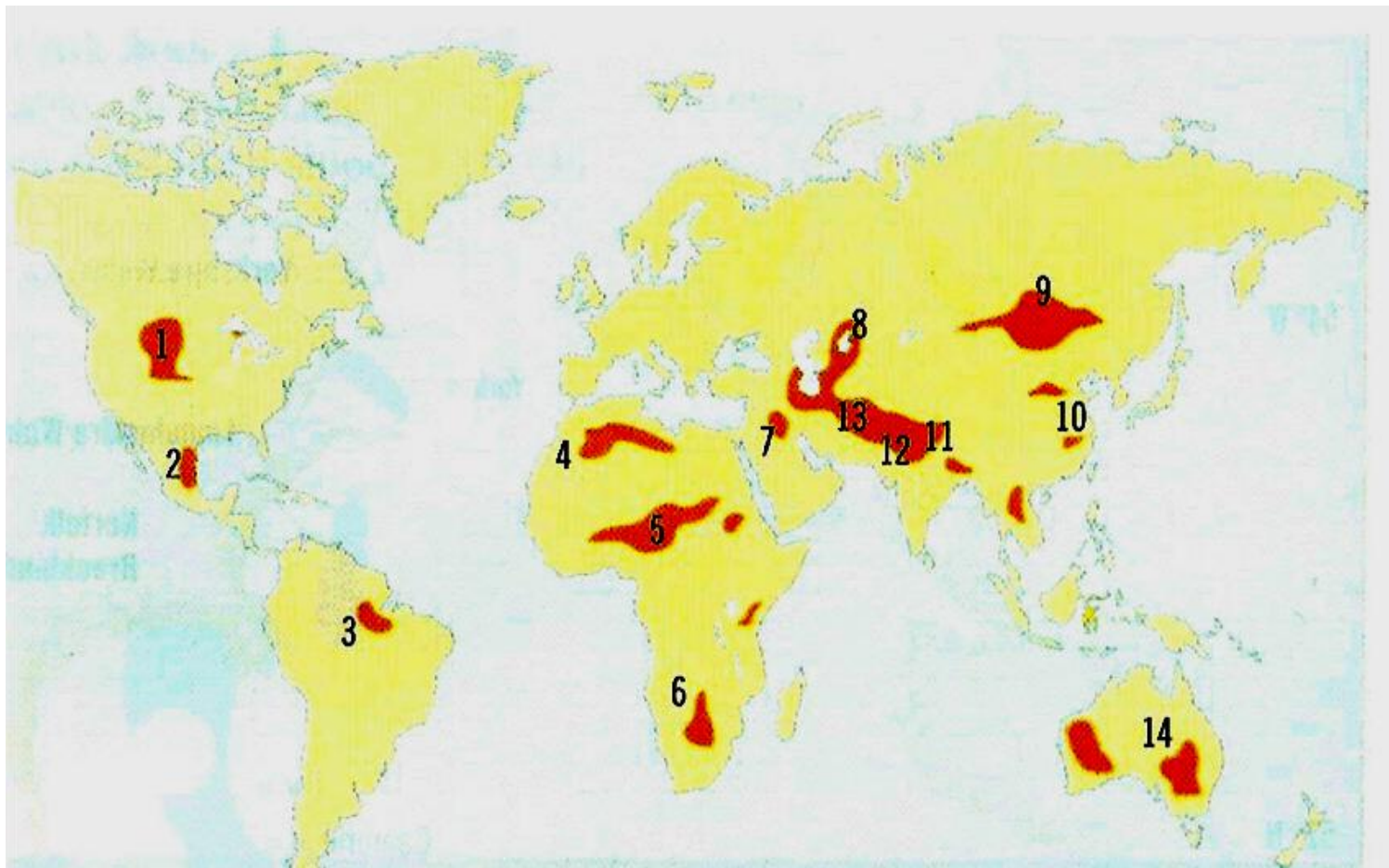
2. Read p.230 to 232 and complete the “To Do” activities p. 232 [IN FULL]

*The Nitrogen Cycle also links with to the syllabus 3.4 Soil System topic and it is not new material but deserves a re-visit. The Nitrogen Cycle was covered in syllabus 2.5.4*

## **3.4.3 Soil Degradation (Erosion)**

Course Companion p.233+

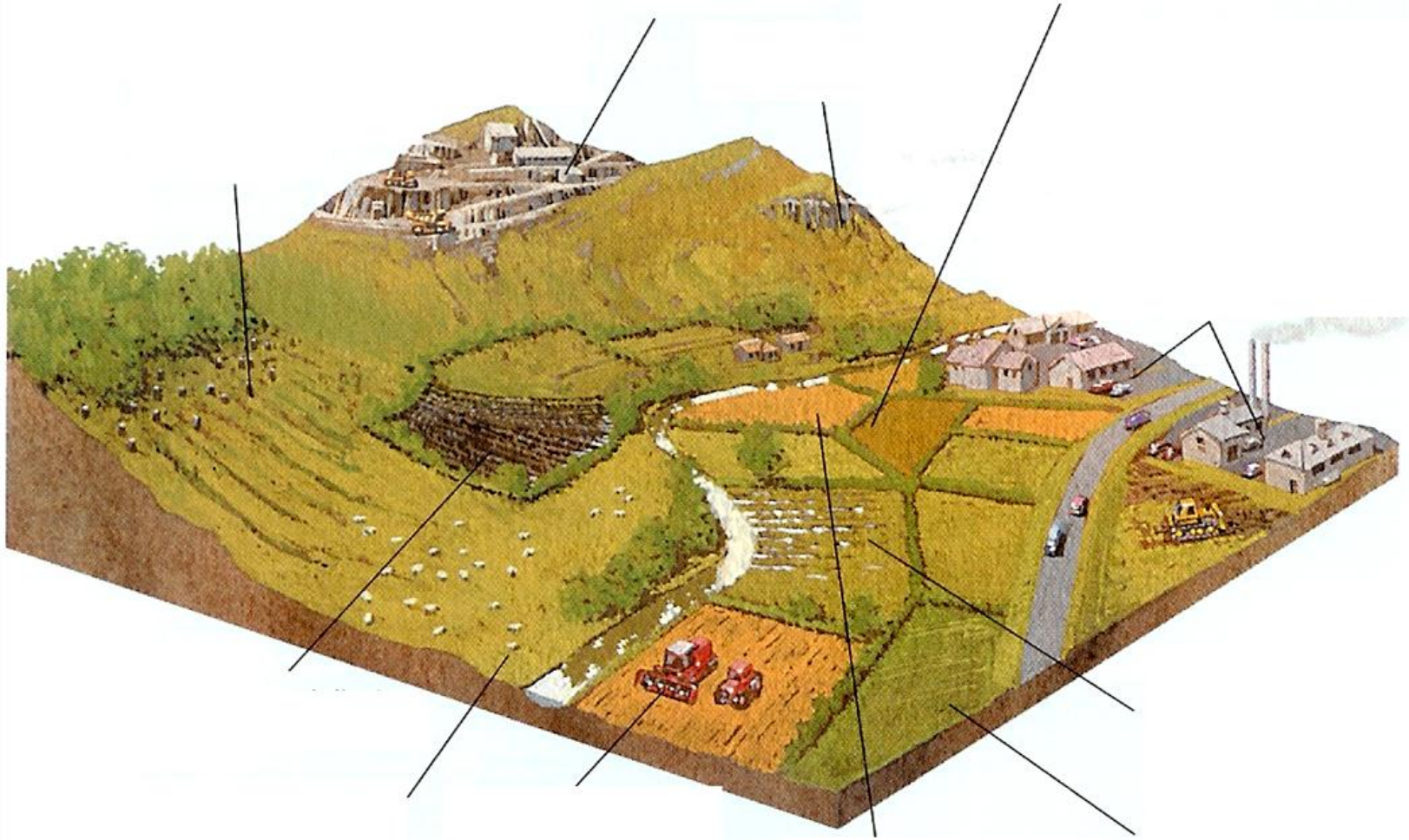
3. students read p.233-239 to  
compliment/complete slide presentation



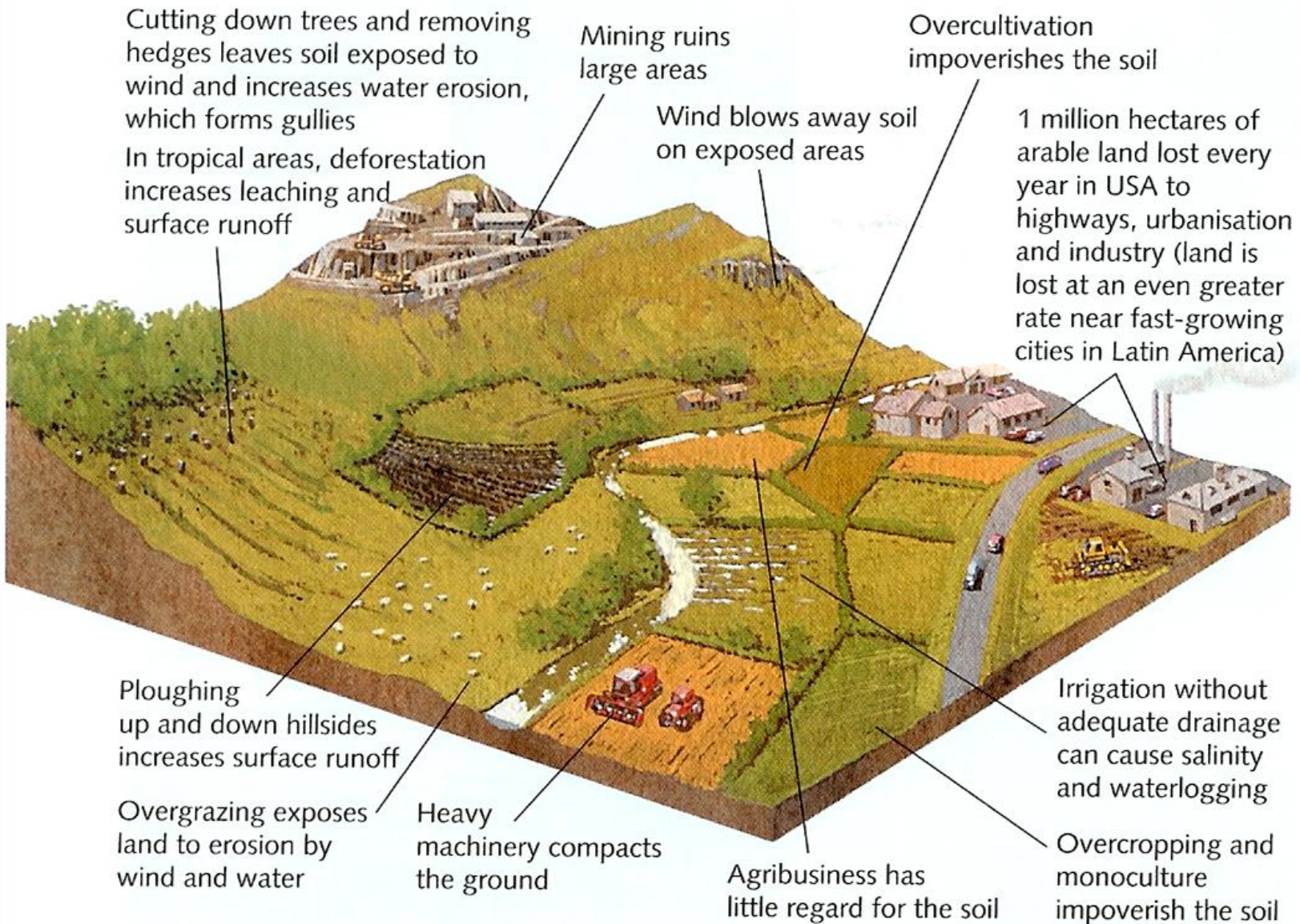
### Key

- |   |  |
|---|--|
| 1 <b>USA:</b> pressure on soils in the grain areas                    | 8 <b>Central Asia:</b> too many livestock, too little careful management   |
| 2 <b>Mexico:</b> erosion and droughts                                 | 9 <b>Mongolia:</b> increasing numbers of herds and people  |
| 3 <b>North-east Brazil:</b> over 40 million population demanding food | 10 <b>Yangtze:</b> China loses over 5 billion tonnes of 'loess' annually   |
| 4 <b>North Africa:</b> tree belts not very successful                 | 11 <b>Himalayan foothills:</b> more than quarter of a million tonnes of topsoil are lost from deforested slopes in Nepal |
| 5 <b>Sahel:</b> probably worst wind erosion area in the world         | 12 <b>Baluchistan:</b> traditional stock-raising and large herds do the damage   |
| 6 <b>Botswana–Namibia:</b> livestock accelerate erosion               | 13 <b>Rajasthan:</b> droughts are becoming a permanent phenomenon  |
| 7 <b>Middle East:</b> erosion spreading at an increasing rate         | 14 <b>Australia:</b> long droughts are aggravated by excessive stock   |

- Soil is an important resource because we depend on it to feed a growing population
- The soil's capacity to produce enough food is being stretched.
- **Soil erosion**: wearing away and loss of soil nutrients due to action of running water and winds – often accelerated by human activity such as farming



## **Soil erosion Causes & Effects**



## Soil erosion Causes & Effects



## **3.4.4 Outline Soil Conservation Measures**



Figure 2 **Contour ploughing, where the farmer ploughs across slopes rather than along them**

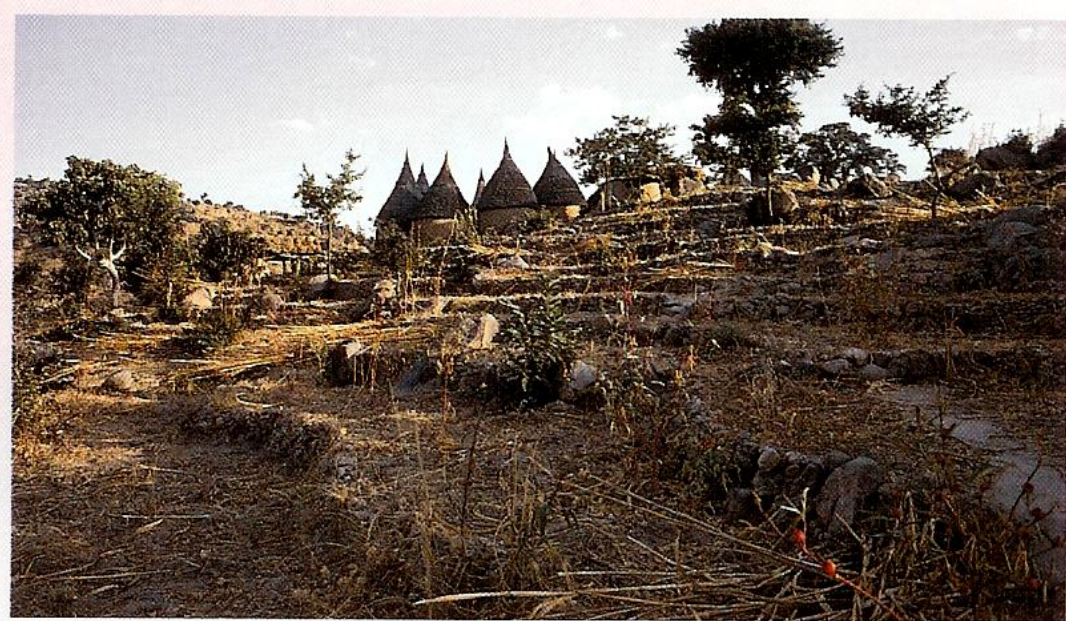


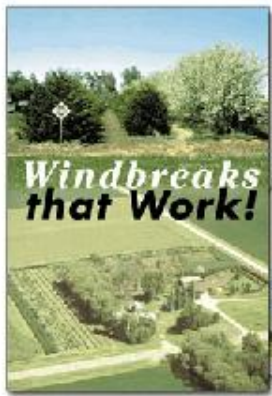
Figure 3 **Bund-like embankments help retain soil wash**



Figure 4 **A shelter belt, such as a line of trees, slows down wind speed and helps protect the land from wind erosion**



Figure 5 **The building of terraces across slopes help to hold the soil on the land** Eventually the terrace becomes level as the soil is caught when it washes down. The major disadvantage of this solution is that it can take up to 10% of the farmland out of production.



wind reduction techniques  
(wind breaks, shelter belts, strip cultivation)

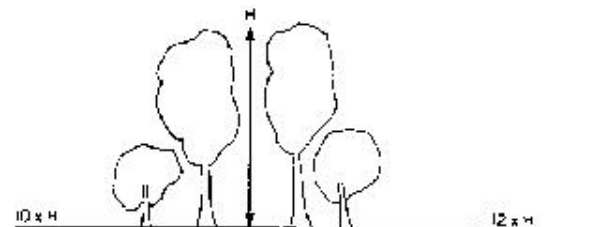
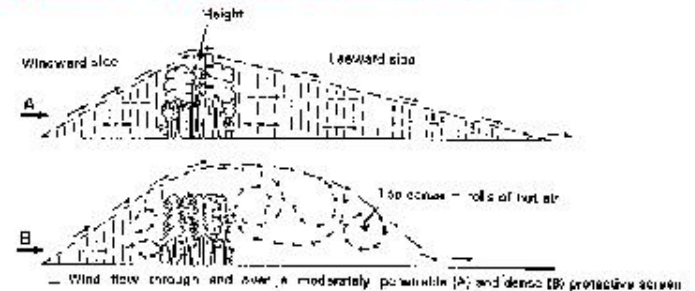


## WIND-BREAKS

Their role is twofold:  
they cut wind-speed to  
reduce both evaporation  
and wind erosion



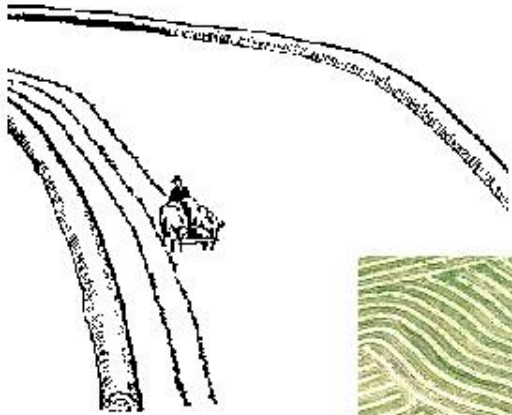
### Influence of a wind-break on the wind:



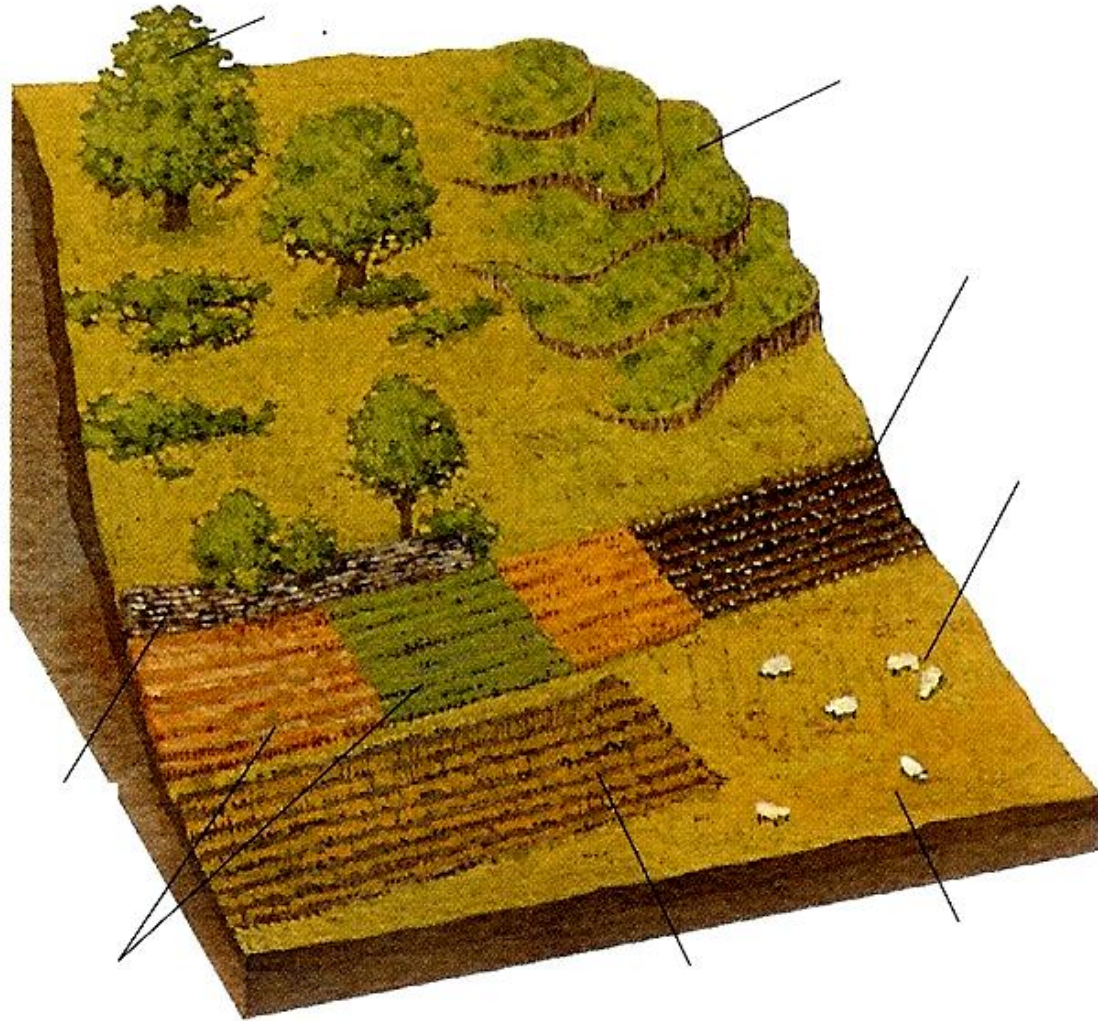
## Strip Cultivation

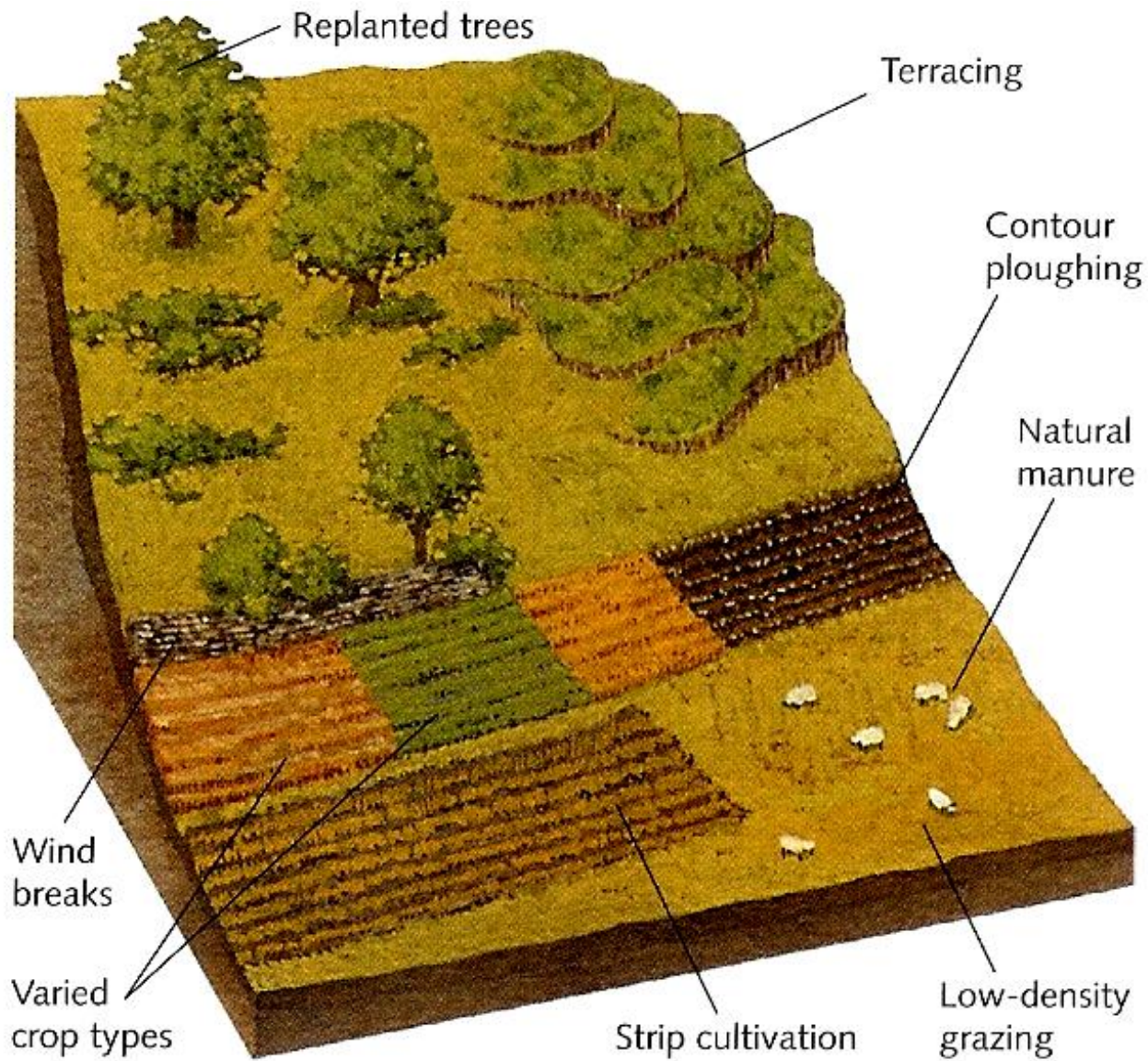


- Cultivation techniques  
(teracing, contour plowing)



# Soil Conservation: Cultivation Techniques





**No-tillage (Conservation) techniques:** methods which focus on keeping the soil undisturbed and the practice of high residue farming

- often rely on pesticides to control weeds and insects during the 4 or 5 years that it may take for the residue or mulch to decompose

- need for specialized equipment for seeding as to not disturb soil

**crop residue:** materials left in the field after crops have been harvested such as stalks, stubble (stems) and leaves.

**mulch:** general term for organic materials that could provide protective ground cover such as manure, wood chips, straw... (is an example of no-tillage technique)



# Soil Conservation: Soil Conditioners Technique





## Daddy Pete's Plant Pleaser

### COMPOSTED COW MANURE

Good for Flower Beds,  
Home Plants, Gardens, Vegetables  
Bushes & Shrubs



Minimum Guaranteed Analysis  
 Total Nitrogen (N) ..... 0.5%  
 Available Phosphate (P<sub>2</sub>O<sub>5</sub>) ..... 0.5%  
 Potash (K<sub>2</sub>O) ..... 0.5%



80104071

**0.5-0.5-0.5**  
 Net Wt. 50 LB/22.68 kg

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COMPOSTED  
COW MANURE

4. Students read 3 case studies (blue shaded boxes) p.238-242 and complete “To Do” p.243 [IN FULL].

***What ever is not completed in class needs to be completed for HW.***