AP ENVIRONMENTAL SCIENCE • EXERCISE SHEET

5.15 Sustainable Agriculture

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS crop rotation 轮作 • cover crops 覆盖作物 • no-till 免耕 • contour plowing 等高耕作 • terracing 梯田

Objective

Build the skills to answer exam questions on **sustainable agriculture**.

You must be able to:

- describe **crop rotation** 轮作, **cover crops** 覆盖作物, **no-till** 免耕, and **contour plowing** 等高耕作
- explain how each conserves soil and nutrients
- link practices to reduced erosion and inputs

1 Worked examples

Study these first. Each one shows the method for a question type used later — follow the steps and you can do the Practice and Exam-style questions yourself.

Sustainable practices

- **Crop rotation** — changing crops each season; restores nutrients (especially with legumes) and breaks pest cycles.
- **Cover crops** — plants grown to protect and enrich soil between harvests.
- **No-till** — planting without plowing; keeps roots holding the soil.
- **Contour plowing / terracing** — plowing across slopes to slow runoff and erosion.

How they conserve soil

They keep soil **covered** and **held by roots**, reducing erosion, and they **restore nutrients** naturally, cutting the need for fertilizer.

A worked link

Planting a legume cover crop over winter fixes nitrogen and protects the soil from erosion, so less fertilizer is needed the next season.

2 Practice

Now apply the methods above.

2.1 How does crop rotation restore soil nutrients? [1]

2.2 How does no-till farming reduce erosion? [1]

2.3 What is contour plowing for? [1]

3 Exam-style questions

3.1 Planting a legume in a rotation helps because it [1]

A B
C D

A removes nitrogen
B adds (fixes) nitrogen to the soil
C increases erosion
D needs no water

3.2 A farmer adopts cover crops and no-till.

(a) Explain how each reduces soil erosion. [2]

(b) State one other benefit of cover crops. [1]

3.3 Explain how contour plowing on a slope reduces erosion. [2]