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Q11

What can be the impact of excessive/inappropriate use of nitrogenous fertilizers in agriculture? 1. Proliferation of nitrogen-fixing microorganisms in soil can occur. 2. Increase in the acidity of soil can take place. 3. Leaching of nitrate to the ground water can occur. Select the correct answer using the codes given below (a) 1 and 3 only (b) 2 only (c) 2 and 3 only (d) 1, 2 and 3 Official key: C.

UPSC Civil Services Prelims 2015 · General Studies · 2 marks · Environment and Ecology

Environment, ecology, climate, biodiversity - Prelims GS Paper I.

Explanation**(a)**

(a) 1 and 3 only. **Nitrate leaching** (3) is real, but statement 1 is the wrong way round: surplus mineral nitrogen typically suppresses, not proliferates, symbiotic nitrogen-fixers. Including 1 knocks this option out.

(b)

(b) 2 only. Acidification from ammonium/urea fertilisers is correct, but leaching of nitrate is also a standard impact. 2 only is incomplete.

(c) Official key

(c) 2 and 3 only. Excess nitrogenous fertiliser can acidify soil and send nitrate into groundwater. It does not cause a bloom of nitrogen-fixing microbes. Statements 2 and 3 are the valid pair and the official key.

(d)

(d) 1, 2 and 3. Statement 1 is incorrect, so the full set cannot be the key.

Summary

Official key is (c) 2 and 3 only. Overuse of nitrogenous fertilisers can raise soil acidity and leach nitrate to groundwater. Nitrogen-fixers are not encouraged by a nitrate glut; they are often outcompeted. Statement 1 is therefore false. The keyed pair is acidification plus leaching.

Related possible facts

These can be asked in a future Prelims paper.

Nitrate leaching

NO₃⁻ is mobile in soil water

Blue baby syndrome

Methaemoglobinaemia linked to high nitrate in drinking water

Soil acidification

Nitrification of ammonium fertilisers releases H^+

Eutrophication

N runoff can bloom algae in water bodies

Biological N-fixation

Inhibited when mineral N is abundant

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