In this issue

Class before Classroom

IITGN orientation programme

In 2016, over one million students wrote the Joint Entrance Exam for the Indian Institutes of Technology (IIT-JEE). Only about 10,500 among those secured a seat. This makes IIT admissions one of the toughest in the whole world, ahead of Harvard University and even Massachusetts Institute of Technology. In order to secure a seat, the students often cut back on time spent in extracurricular activities and this may continue during graduation. To reignite passion, spark and creativity in students, Indian Institute of Technology Gandhinagar has introduced a unique foundation course.

On page **217** of this issue, Srinivas Reddy and Sudhir K. Jain discuss the novel orientation programme during which students are allowed to participate in varying activities. For five weeks, there are no formal classes or fixed curricula. This structure is modelled to include five major themes – values and ethics, creativity, teamwork, social awareness and physical fitness – to nurture the creative outlook and social wellbeing of a fresh batch of students. Why is it being applauded and what role could it serve in transforming student perceptions and outlook? Answers in a General Article.

Custom Made Fertilizers

Cost, availability and benefits

There is a certain charm to custom made clothing – it is unique and fits better as opposed to off the rack apparel. The same applies to fertilizers. The idea of customized fertilizers may sound bizarre to many, but the truth is that soils from different regions differ in composition which is why different crops are grown in different areas. Now, in a Review Article, in this issue, scientists from University of Agricultural Sciences, GKVK, Bengaluru make a case for customized fertilizers.

Though plants grown in different regions have different growth requirements, for a very long time, till 2010, fertilizers available in the market came with the same formula – nitrogen, phosphorus and potassium in the ratio of 4 : 2 : 1. After 2011, the ratio has been altered. But such general shifts in ratio that cater to a broad region are not sufficient to meet the needs of agriculture. Deficiencies of many micronutrients are prevalent in different soils of India.

This problem can be solved by adding the lacking minerals to a given patch of land, based on soil type and the vegetation it supports. The approach has attracted a lot of attention as there is a constant need to increase production for feeding a growing population. However, due to the lukewarm attitude of the government on this matter, the popularity of customized fertilizers remains low. As a result, costs of customization are also high. More in a Review Article on **page 242**.

Fertility Losing Ground

Desertification in South India

Nearly one fifths of the land across the globe is threatened with desertification. But tracking this change requires a lot of effort and time. Now scientists from National Bureau of Soil Survey and Land Use Planning (ICAR-NBSS&LUP), Bengaluru, Space Application Centre, Ahmedabad and ICAR-NBSS&LUP, Nagpur have found a way of keeping pace with this process. On **page 331** in this issue, they discuss how they have successfully mapped desertification in Telangana, Andhra Pradesh and Karnataka using remote sensing tools.

Desertification can take place due to both natural and anthropogenic causes. Agriculture, particularly extension of cultivation into marginal lands, and inept irrigation practices, contribute heavily to the process. While all the three South Indian states share proximity, they are distinct from each other in terms of environment, temperature and altitude. Scientists monitored these areas through satellite imaging during different seasons in 2003–2005 and then again between 2011 and 2013 to track changes in desertification.

Through satellite images, they could identify desertification patterns and also propose the most likely causes of this change. While vegetal degradation played a dominant role in the desertification of Andhra Pradesh, water erosion was the front-runner for desertification in Karnataka. In a Research Communication, scientists share how they managed to decode these changes from satellite images.

Particles in the Air

Traffic and air quality correlation

Air quality over Delhi has deteriorated over the years. Frequent monitoring has shown that just as city roads are choked with cars, buses and bikes, the air above is laden with particulate matter bearing traces of toxic elements that could be detrimental to health.

One reason the condition has aggravated so much is traffic. Everyday scores of students, professionals, artisans and daily wagers travel to different parts of the national capital region. As these numbers keep increasing, the air quality is only set to decline further. To limit air pollution due to traffic, the Delhi administration introduced an experimental odd–even rule for use of cars on Delhi's roads. On days with an even date, cars bearing even number plates were allowed on roads and vice versa. The scheme ran for two weeks.

In the days leading up to the experimental scheme and for up to two weeks after it, scientists from the CSIR-National Physical Laboratory and the Jawaharlal Nehru University, New Delhi, and the Academy of Scientific and Innovative Research, Ghaziabad assessed the air quality in the city. To find out how the strategy panned out, turn to a Research Communication on **page 315**.

Sarah Iqbal
e-mail: sarah.iqbalv@gmail.com