RAISING CROPS IN ARSENIC CONTAMINATED SOIL

Relevant for: Indian Economy | Topic: Major crops, Cropping patterns in various parts of the country incl. Various Agriculture Revolutions

An Indian scientist in the U.K. is working on a way to grow crops in arsenic-contaminated soil, a study which is likely to have wide ranging impact for farmers in northeastern India.

Dr. Mohan T.C., from Dr. Alex Jones Laboratory at the School of Life Sciences at the University of Warwick, conducted a pilot study in transgenic Barley and is now looking at doing it in rice plants following funding from the Medical and Life Sciences Research Fund, U.K.

The university made the announcement on Wednesday, to mark World Soil Day on December 5. "To stop the cancer-causing arsenic entry into the food chain, it is essential to develop safe crops, through restricting the translocation of arsenic to edible part," he said. "In our current project, we are trying to manipulate cytokinin hormone in rice plants through genetic engineering and we expect to increase the roots detoxification capacity of the transgenic rice."

Presence of arsenic in soil is a worldwide problem. The chemical is carcinogenic and is naturally found in water supplies and soil, particularly in parts of North-east India and Bangladesh.

Arsenate is the most abundant form of arsenic and is structurally similar to phosphate. Therefore, it is easily incorporated in to plant cells through phosphate uptake pathway — the process of the roots absorbing nutrients. However, when a plant absorbs arsenic it can translocate it up to the edible part of the plant — ultimately arsenic enters food chain. Plants have an inherent capacity to cope with arsenic stress by producing metal-chelating peptides called phyochelatins (PCs).

PCs detoxify the arsenic and restrict the movement of arsenic in the roots, which in turn helps to reduce the root-to-shoot translocation of arsenic. Phyochelatins are therefore essential in trapping the arsenic absorbed by the plant in the roots.

Scientists at the University of Warwick wanted to make plants with more phytochelatins in the roots, to stop any of the arsenic escaping and travelling up the shoot to the edible part of the plant. The university said this is being done by making transgenic plants with reduced cytokinin hormone in the roots, which means phytochelatin is boosted and can detoxify and hold more arsenic in the root.

Here are some of the most interesting research to have appeared in top science journals last week

Our existing notification subscribers need to choose this option to keep getting the alerts.

Downloaded from crackIAS.com © Zuccess App by crackIAS.com

END