EDITORIAL

Research Needs on Conservation of Native Plant Species and Increasing Crop Productivity under Sustainable Agriculture

COLUMN

Ratikanta Maiti

Honorary Professor, Universidad de las Americas, Departamento de Quimica y Biologia, Santa Catarina Martir, C.P., Puebla (72820), Mexico

Correspondence to

E-mail: ratikanta.maiti@gmail.com

The increased erratic climatic conditions, drought, salinity and other abiotic stresses are affecting bio-resource, native plants, biodivesrsity and crop productivity, thereby threatening food security of the world. With respect to plant species, many native plant species such as cactus, several economic plants such as wild chilli (*Chile piquin*), lechuguilla, yucca, candelilla, etc. are endangered owing to extensive exploitation for economic benefit of local people. There is a great necessity of the recovery of ethnic knowledge of medicinal plants, inherited from generation to generation since remote past. There is a great necessity of a systematic research, viz., ethnobotany, pharmacognosy, histochemistry, phytochemistry, etc. Very little research is undertaken for conservation and propagation of these native plant species. Techniques have been developed for propagation of 40 cactus species and wild chilli, is a step forward in this direction. Concerted research activities need to be directed in this vital aspect.

The forest resources could be effectively managed for the benefit of mankind but expansion of urbanization has led to extensive logging of trees, thereby disturbing forest ecosystem and biodiversity. The incorporation of agro-ecosystem has great scope in improving economy of forest dwellers. Little attentions are directed for the development of efficient techniques for germination and propagation of native tree species and reforestation in the disturbed areas. A good knowledge of the time of flowering, fruit maturity and seed dispersal of the tree species is an essential need for good management by the forest managers, but very little attempts have been made towards that direction.

Though significant progress has been made in understanding the physiological-biochemical and molecular mechanism of resistance to abiotic stress, very little attention and progress has been attained in increasing crop productivity under sustainable agriculture. About one-third of arable land of the world is affected with semi-arid conditions and two-thirds of these lands by saline soils. Very little progress has been attained to increase productivity under these stress prone areas. High technology high yielding cultivars cannot thrive in these stress prone areas, on the other hand drought and salt tolerant pipe lines crop varieties could increase crop productivity in these areas.

In this juncture, all young scientists should join together and form an inter-disciplinary team to address these two vital issues:

• Restoration, conservation and recovery of ethnic knowledge of bio-resources, native plants and animals; and

• Development of low cost technology with an attempt to increase crop productivity under sustainable agriculture in the farmers' fields affected with several abiotic stresses such as drought, salinity.

Low cost technology may be utilized in mass-scale screening of crop cultivars for tolerance to salt, and drought. Then the performance of these selected cultivars could be tested in the field and finally confirmed by molecular biologists for their validity.

All the conventions by the United Nations have been focussed on the issues of equitable sharing and sustainable utilisation of natural resources. It is possible through the concerted efforts of not only the Governments but also every individual.

Green revolution could achieve the goal of increased productivity. It introduced the use of hybrid seeds, mechanical implements, synthetic fertilizers, pesticides and insecticides under irrigated conditions to achieve this. However, the damages caused due to the developmental activities are being experienced

through pollution of air, water and soil, green house gases and global warming with a cascading impact on the bio-resources, biodiversity, challenging the very survival of the mankind.

The world plant stress group is talking of second green revolution. I feel strongly that this green revolution will not only be directed to increase crop productivity under high input situations but also to increase productivity under sustainable agriculture utilizing low cost technology.

The climate change, a natural phenomenon through millions of years has led to the present day magnitude of biodiversity through adaptation and selection. The process of evolution has also witnessed a natural extinction of the non-adaptable species. However, human activities have accelerated the rates of extinction thousand-fold. It is feared that one species is lost every two hours. Hence, conservation of natural resources, biodiversity and the habitats with special reference to the endemic species has been seriously taken world over.

