

school curriculum. Things must be set right before students leave school. 'You just cannot teach an old dog new tricks'!

Most 'respectable' schools are nothing more than rigorous coaching camps for the grand entrance examinations. And this is because entrance examinations continue to be the most decisive, career-clinching, status-shaping, image-building event in a child's life. Natural selection in educational survival has carefully deleted every trait that does not fetch a rank in entrance exams. The result is a morbidly convergent, agonizingly bookish, and brutally restricted curriculum.

Somebody asked a Chinese philosopher, 'Why is it that all men are born equal, but some become great and others remain small?' His answer was, 'While those who pursue what is great

within grow up to become great; those who pursue what is small in them remain small'.

How profoundly true! The diversity of human talent is amazing. While some can sing, others excel in mathematics or painting. Instead of nurturing what is inherently estimable in a child, parental pressure compels the child to focus entirely on exams. All extra-curricular activities which do not lead to a prize are scorned. Children are reprimanded for reading 'story books'. Languages are neglected because they are not represented in the entrance examinations. An 'enlightened' Chief Minister even suggested deleting social sciences from the school curriculum. 'English medium' is viewed as the be all and end all of 'good education'!

We have failed in both identifying and nurturing talent. Our schools are

singularly inimical to genius. Why blame the universities for bad science? The mad rush at a professional career is typical of a country that offers no social security. Our problems are political first. Naturally, the remedies tend to be political too.

The ambitious District Primary Education Programme (DPEP) in Kerala, presumably the most enlightened state in India, has failed. The lessons are foreboding. Policy decisions and statutes cannot reform society. You cannot legislate morals and attitudes in a democracy. The nation itself must awaken. And it will take time.

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NEWS

Biological control of insect pests*

Pest-related damages result in an estimated Rs 50,000 crore loss annually in agricultural production in the field and storage in India, according to a recent estimate by the Union Ministry of Agriculture. It has been reported that nearly half of the potential yield of rice may be lost due to pests.

Chemical control of insect pests is the most dominant approach at present. It is responsible for many health hazards among people and livestock. The Union Ministry of Agriculture is concerned with the slow progress in Integrated Pest Management (IPM), as there is an increasing demand for chemical pesticides, which was put at 50,464 tonnes in the year 2000–2001 as against 43,381 tonnes in the previous year. The pesticide industry estimated the demand for 2000–2001 at over 86,460 tonnes. India's consumption of biopesticides

like botanical and microbial pesticides, parasitoids, predators, pheromones and insect growth regulators is less than 1% of the total insecticide consumption in terms of value, compared to 12% globally.

Natural enemies of insect pests play a key role in reducing the levels of pest populations below those causing economic injury. Both natural and applied biological control tactics are important in successful management of pest populations. After nearly two decades of intensive teaching and field level training, farmers have understood the value of biological control. Having realized that most of the synthetic chemicals decimate the beneficial parasitoids and predators, the farmers have started using selective pesticides along with biological control agents and botanical pesticides like neem products.

Keeping this as the focal point, a National Symposium on 'Biological Control of Insect Pests' discussed various aspects of biological control measures available for controlling insect pests of different crops. In his inaugural

address, M. B. Pranesh (Agriculture Department, Government of Tamil Nadu) stressed the need for evolving a feasible biopesticides technology for the control of field pests. The technical programme was divided into six different sessions to discuss various eco-friendly biological control measures.

S. Jayaraj (Indian Council of Agricultural Research, Madurai) introduced the theme of the symposium and highlighted points such as crop losses due to pests, pest mismanagement, natural pest control, availability of biological control agents, scenario of biopesticide usage, use of neem, *Bt* transgenics, weed pests, insect pheromones, etc. and suggested models for country-wide production and use of biocontrol agents as a major component of IPM. G. P. Gupta (Indian Agricultural Research Institute, New Delhi) presented a detailed account on the environmentally safer methods for the management of *Helicoverpa armigera* using azadirachtin-rich neem and *Bt* formulations coupled with other biotechnological approaches. T. C. Narandran (University of Kerala, Calicut)

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spoke about certain problems encountered in insect identification. M. Mani (Indian Institute of Horticultural Research, Bangalore) presented several biological control options of vegetable pests using various predators, parasitoids and microbials like NPVs. A. J. Tamhankar (Bhabha Atomic Research Centre, Mumbai) gave an account on the use of pheromones for arriving at moth catch levels and economic threshold levels (ETL) of cotton bollworms. S. Devasahayam (Indian Institute of Spices Research, Marikunnu) presented the biological control measures for pest on spices. Plant morphological characteristics and secondary plant substances are reported to interfere with the mobility of natural enemies, impair development and fecundity, and reduce their effectiveness for pest management. While discussing the host plant resistance (HPR) as an influencing factor on activity and abundance of natural enemies, H. C. Sharma (International Crops Research Institute for the Semi Arid Tropics, Hyderabad) recommended varieties of crop plants with moderate levels of resistance as best suited for use in pest management, in combination with natural enemies. S. Easwaramoorthy (Sugarcane Breeding Institute, Coimbatore) along with C. Sankaranarayanan, discussed the potential role of entomopathogenic nematodes in controlling sugarcane insect pests, viz. *Chilo sacchariphagus indicus*, *Scirpophaga excerptalis*, *Holotrichia serrata* and *Leucopholis lepidophora* and pests of rice, maize, potato, groundnut, sunflower, pulses, etc.

The mangement of teak defoliator (*Hyblaea puera*) using biological means was discussed by George Mathew (Kerala Forest Research Institute (KFRI), Peechi). An NPV (*HpNPV*) identified and characterized at KFRI has also found wide applications in teak ecosystem. He also highlighted lack of infrastructure to monitor pest outbreaks in forest ecosystems and to carry out control operations. R. J. Rabindra (Tamil Nadu Agricultural University, Coimbatore)

discussed possibilities of using the broad spectrum *Galleria mellonella* NPV (*GmNPV*) for the control of lepidopteran pest complex of crucifers, viz. *Plutella xylostella*, *Hellula undalis* and *Crociodomia binotalis*. The *GmNPV* was found to have cross infectivity in *Chilo sacchariphagus indicus*, *Cnaphalocrosis medinalis*, *Chilo partellus*, *Opisina arenosella* and *Maruca testulalis*, infesting various other crops and safety to beneficial insects. V. L. Maheswari (North Maharashtra University, Jalgaon) elaborated upon the use of botanicals for the post-harvest protection of pulses. Most of the locally available plants, viz. *Calotropis procera*, *Annona squamosa*, *Ricinus communis* and *Nerium indicum* were found to control *Callosobruchus chinensis* effectively. P. Narayanasamy (Annamalai University, Chidambaram) highlighted various biological methods to control rice brown planthopper.

An interesting account on the gerrid predators associated with rice ecosystem in West Bengal was presented by S. K. Mandal (Bidhan Chandra Krishi Viswavidyalaya, Nadia). Five gerrid predators, viz. *Limnogonus nitidus*, *L. fossarum*, *Neogerris parvula*, *Rhagadotarsus kraepelini* and *Aquarius adelaidis* were reported to be predominant and preying on rice hoppers. One paper dealt with the use of Reduviid predators in pigeonpea pest management. Another paper discussed the possibilities of controlling the cotton bollworm by using Reduviid predator, *Rhinocoris longifrons*. Some of the papers discussed the synergistic interactions of biopesticides with chemical pesticides for judicious application in field conditions. S. K. A. Rizvi (Aligarh Muslim University, Aligarh) discussed the possibilities of controlling teak locust, *Gastrimargus africanus*, with the help of red mite, *Eutrombidium trigonum*. A new record of the coccinellid predator, *Coelphora unicolor* for the control of whitefly, *Dialeuropora decempuncta* in mulberry in Assam was presented by G. Rajkova (Centre for

Integrated Sericulture Research, Jorhat). K. Narayanan (Project Directorate of Biological Control, Bangalore) detailed observations on a new NPV of coconut skipper, *Gangara thyraxis*, which in laboratory studies effected 100% mortality within 5–6 days of inoculation.

The deliberations at the symposium were pointed towards the need for identification of newer agents for control, adaptability, accessibility, mass production possibilities and environmental assessment on introduction. Some important recommendations were made for future course of action and research. A thrust was given for setting up of a network of National Natural Enemy Repositories for maintenance, culture and supply of natural enemies of insect pests to interested scientists to carry out area-specific studies. For effective implementation of IPM in the fields, there is a need to encourage insect taxonomic research in India, particularly the biosystematics of certain complex groups of insect pests, and entomopathogens. Conservation and use of biocontrol agents, assessment of yield along with the data on natural enemy population, caution and preparedness against possible invasive pests are required for effective implementation of an effective IPM. Use of organic manuring was emphasized to enhance the levels of neutrals and detritivores like micro-crustaceans, chironomids, etc. for better survival of certain predators. Effective IPM measures need to be developed for horticultural crops and spices. Cotton ecosystem can be studied, in detail, for identifying parasitoids and predators, other than the documented ones, as there is larger scope for biocontrol. Farmers and NGOs should be imparted with training on the mass production of biocontrol agents and their field release.

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