Prospectives of information technology in sustainable agriculture

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Introduction
Advancement in information technology has opened up newer avenues in all the sectors. Interest in and the use of information technology in agriculture planning and development have accelerated in recent years. Information technology can be used to facilitate faster understanding of single as well as multiple aspects of the pace in agricultural development. A significant benefit of IT is its ability to visualize the mass information on crop protection, to interpret information visually and to improve effectively, which can be helpful for quick decision making for pest management programmes (Harris and Scott, 1999). IT applications in agriculture allow systematic collection of information or data, updating, processing and distribution of related information or data. The IT environment is able to provide a powerful means to develop and compare alternative plans in crop protection towards integrated pest management.

Information technology and pest management
It is an already established fact that CD-ROM technology offers databases in agriculture, which is of the highest relevance. CD-ROM is now well established as a powerful and compact delivery mechanism for databases. The growth of CD-ROM availability has been explosive, led by the producers of bibliographic databases. Each disk can store 600 million characters (CABI, 1991). The examples of bibliographic databases are AGRICOLA, AGRIS and BIOSIS. The technology is reliable and inexpensive and remarkably simple to learn. No special computer expertise is needed and hardly any understanding of the principles of information retrieval beyond a conception of what is being searched for.

Expert systems
Pest control
Another branch of information technology that shows great promise for pest control is known as expert systems. The use of expert systems in pest management is reviewed by Lindsey & Novak (1989), Heong (1989) and Scott (1991). In this system, the decision making can be reduced to a set of logical rules, then a computer can be equipped with software to emulate the human expertise (Fig.1).

Pest diagnosis
Interactive diagnostic key systems such as INTKEY and CABIKEY have been successfully used for handling diagnostic information about many characters for large groups of organisms. It includes colored illustrations of diagnostic differences between taxa and of the whole organism to which a diagnosis points. Recent advances in screen displays have made a major contribution.

Quarantine information
Electronic cataloguing of plant quarantine database is essential for quarantine applications, which greatly facilitates updating. Information on pest data sheets, pest distribution maps, host-lists, quarantine pest databases, pest risk assessment and pest forecasting system are to be computerized for global information network.

Pest data sheet
Identity
Names
Synonyms
Taxonomic position
Common names
Notes on taxonomy and nomenclature

Host
Geographical distribution
Europe
Asia
North America
Central America and Caribbean
South America
Oceania

Biology
Detection and identification
Means of movement/dispersal
Pest significance
Economic impact
Control
Quarantine risk
Phytosanitary measures

Bibliography

Conclusion
Since agriculture is the backbone of Indian economy, the effective utilization of innovative technologies for its sustainable development must be the need of the hour. No doubt, information technology has emerged as a innovative tool in an era of agricultural revolution. Information technology will provide a 'holistic' approach for efficient planning and quick decision making for pest management programmes.
Fig 1. Portion of a strategic decision tree used in making recommendations for control of brown plant hopper in rice, suitable as a basis for an expert system.

Reference


