

**TWO-DECADE CHANGES IN RICE TECHNOLOGY AND PRODUCTION  
PERFORMANCE IN A WEST JAVA VILLAGE**

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**ABSTRACT**

Technological innovation enabled Indonesia to achieve rice self-sufficiency in 1984, but rice yield stagnated during the 1990s. In order to ascertain the rice production mechanism, a questionnaire survey of 50 farmers was conducted in 2001 in a West Java village, where a similar survey was conducted in 1983. Based on these two surveys, technological changes and production performance over two decades are examined in this paper.

Rice yield decreased from 5.60 tons/ha in 1983 to 5.06 tons/ha in 2000 in the study village, and rice cultivation techniques changed towards labor-saving technology. Although paddy price has increased, the cost increased even more, resulting in a lower profitability in 2000. Production function analysis revealed that land was the most significant factor in increasing rice income. The contribution of fertilizer, which was the second significant factor in 1983, declined to be the smallest contributor among four factors in 2000. It was argued that the use of compost should be promoted in order to increase rice yield in the study area.

**Key words:** rice farming, technological change, production efficiency, rice yield, production function.

**INHERITANCE OF RAPD MARKERS LINKED TO CMV-B2  
RESISTANCE GENE IN MELON**

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**ABSTRACT**

The inheritance of resistance to an Indonesian isolate of Cucumber mosaic virus (CMV-B2) in melon cultivar Yamatouri was previously determined and it is controlled by a single dominant gene, to which the symbol *Creb-2* was assigned. In this study, P<sub>1</sub> Yamatouri, P<sub>2</sub> Vakharman, and F<sub>1</sub> generations were used to study the inheritance of RAPD markers linked to *Creb-2* in F<sub>1</sub> hybrid of Yamatouri. The results showed that two RAPD markers linked to *Creb-2* were present only in resistant P<sub>1</sub> Yamatouri and F<sub>1</sub> generation, respectively. Furthermore, to elucidate the source of *Creb-2*, resistant Mawatauri and susceptible Andes were evaluated and the two RAPD markers linked to *Creb-2* appeared in Mawatauri, but not in Andes. These results revealed that *Creb-2* in melon Yamatouri and F<sub>1</sub> generations was derived from the resistant parental cultivar Mawatauri.

**Keywords:** *Creb-2*, a single dominant gene.

**INSECTICIDAL ACTIVITY OF *Tinospora crispa* LEAF  
EXTRACT AGAINST DIAMONDBACK MOTH IN CABBAGE**

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**ABSTRACT**

Stems of *Tinospora crispa*, a tropical plant, is known to possess insecticidal properties. However the insecticidal activity of the *T. crispa* leaf has not been evaluated. The insecticidal activity of *T. crispa* leaves against diamond back moth (*Plutella xylostella*) in cabbage was evaluated under laboratory and field conditions and compared to profenofos, a synthetic insecticide.

Results of the present study revealed that the application of *T. crispa* leaf extract reduced feeding activity of *P. xylostella* larvae under both laboratory and field conditions. Application of the leaf extract at 0.1 to 4.0% could reduce feeding activity by 19.5 to 100%. Application of the leaf extract in the field at 0.1 to 1.0% reduced significantly larval density, damage intensity while increasing the percentage of plants that produced heads and the weight of individual heads. Applications at 0.5, 0.7 and 1.0% were comparable to the application of 0.075% profenofos.

**Keywords:** activity, larval mortality, damage intensity

## ACTIVITIES ON PLANT GENETIC RESOURCES IN MYANMAR SEED BANK

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### ABSTRACT

Myanmar is very rich in crop biodiversity. This is because she has diversified agro-climatic conditions from tropical to temperate regions, from lowland to high snow-covered mountains, and from humid areas to dry zones. This country consists of seven states and seven divisions and shares borders with Bangladesh, India, China, Laos, and Thailand.

However, recently there is conspicuous tendency towards the reduction of genetic resources (genetic erosion), since economic crops and/or improved crop cultivars are rapidly diffused by agro-economical development. In particular, a large number of rice landraces have been lost since the introduction of high-yielding cultivars around the end of 1970's.

In order to prevent genetic resources from eroding, the Government of Myanmar initiated the Seed Bank Project in 1990 in cooperation with the Japan International Cooperation Agency (JICA). Seed storage facilities attached to experimental units were constructed in 1990 and a project-type technical cooperation was continued from 1997 through 2002. A system for collection, characterization, evaluation, preservation, and documentation of crop genetic resources was established in the Seed Bank of the Central Agriculture Research Institute to ensure their effective utilization in crop breeding programs and/or to contribute to agricultural development in general.

The Myanmar Seed Bank has dispatched several exploration missions to various parts of the country to collect crop genetic resources, and characterized and evaluated a total of 7,108 accessions.

So far, 7,558 accessions of 21 plant species have been preserved as an active collection stored at 10°C and as a base collection stored at -5°C in the seed stores. Documentation has been carried out under the computer-based data management system.

The activities of the Myanmar Seed Bank are not only globally contributing to conservation and sustainable utilization of plant genetic resources but are also domestically useful for the development of new cultivars.

**Keywords:** crop genetic resources, data management, collection, multiplication and evaluation, preservation

**REGENERATION AND CLONAL PROPAGATION OF VIRUS-FREE PLANTS  
OF GREATER YAM (*Dioscorea alata* L.) BY TISSUE CULTURE**

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**ABSTRACT**

Virus-free greater yams (*Dioscorea alata* L.) were successfully regenerated from the shoot apex culture using medium supplemented (MS) with 0.01mg/l of two plant hormones, naphthalene acetic acid (NAA) and benzyl adenine (BA). The shoot apex culture was followed by nodal segment culture in an MS with a higher concentration of sucrose in order to multiply virus-free plants *in vitro*. The RT-PCR method was employed to detect pathogenic viruses such as YMV, YMMV, JYMV in the present investigation. As a result, viruses were not detected in plants regenerated from the shoot apex culture followed by *in vitro* propagation of nodal segment culture. A new efficient method of development and clonal propagation of virus-free plants of greater yam has been devised by combining the two types of tissue culture methods namely, shoot apex culture and nodal segment culture. This method is expected to be a promising means for efficient production of large quantities of virus-free seedlings of greater yam.

**Key words:** *In vitro* propagation, RT-PCR, virus disease, virus-free seedling

**SUSCEPTIBILITY OF DIFFERENT POTATO VARIETIES AGAINST  
POTATO COMMON SCAB IN VIETNAM**

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**ABSTRACT**

Potato common scab caused by *Streptomyces scabies* is one of the biotic factors that can reduce farmer's income in potato production. The prevalence of the disease does not only depend on the pH and chemical properties of the soil as well as climate conditions, but also on the potato genotypes. In Vietnam, potato common scab occurs in most parts in the north during the winter cropping season. This paper presents the difference in susceptibility of four potato varieties, namely KT.3, VT.2, Diamond and Nicola against potato scab. The scab tuber percentage and scab index has a wide range, and differs from year to year and from variety to variety. The Dutch varieties (Diamond and Nicola) seemed more susceptible than the Chinese variety (VT.2). The domestic variety (KT.3) is the least susceptible to potato common scab.

**Key words:** *Streptomyces scabies*, variety, cultivar

**FOOD SAFETY AND GROUP CONTRACT FARMING: A CASE STUDY OF AN ASPARAGUS GROWER GROUP IN NAKHON PATHOM OF THAILAND**

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**ABSTRACT**

Being in the central plain of Thailand, Nakhon Pathom is a rich source of produce due to its fertile soil and good irrigation systems from Tha Chin and Mae Klong rivers. The main agricultural products are sugar cane, various vegetables, dairy cattle, swine and poultry. Most of these products are commercially distributed by individuals or through a group contract farming system.

Asparagus production is one group contract farming scheme which has been successful in showing that a consortium of farmers, agribusiness firms and consumers can obtain a much better deal than the individual contract type. If the asparagus farmers are fully aware of quality and food safety standards, a net income of USD 7,438 per ha is attained whereas other vegetables and rice earn only USD 2,784 and USD 1,227 per ha, respectively. Using this type of contract system together with good management of farm practices, this group of farmers, agribusiness firm and government authority can truly maintain safe produce of high quality. Food safety of agricultural products usually depend on the following considerations:

1. Farmers themselves should safeguard their own health with frequent blood check ups. They should also have more concern about consumer health than just having a higher price tag in the market.
2. Researchers should recommend to farmers the use of organic farm inputs than the usual conventional crop protection chemicals.
3. Consumers should be more conscious of food safety rather than physical appearance.

**Keywords:** merit of group contract farming, farmers' paradigm shift

**A NEW MICROBIAL CONTROL AGENT FOR THE DIAMONDBACK MOTH,  
*Plutella xylostella* LINN**

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**ABSTRACT**

The diamondback moth, *Plutella xylostella* Linn, is an important pest of cruciferous crops everywhere in Asia. Through the excessive use of pesticides, *P. xylostella* developed resistance to pesticides in many places. In order to control these pesticide-resistant *P. xylostella*, the use of microbial agents could be an option or alternative. In the present study, *Beauveria amorpha*, which was isolated from a dead Chrysomelid beetle collected in Bali, Indonesia, was found to effectively kill 90% of *P. xylostella* larvae in laboratory experiments. Here we present details of the infectivity tests of the *B. amorpha* isolate.

**Keywords:** *Beauveria amorpha*, biocontrol agent, entomopathogenic fungus, biopesticide

**A SYNOPTIC CLIMATOLOGICAL STUDY ON THE LONG-RANGE  
TRANSPORTATION OF COAL COMBUSTION AIR POLLUTANTS USING  
TELLURIUM AS A TRACER**

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**ABSTRACT**

The applicability of tellurium (Te) as a tracer of coal combustion effluent was investigated with the aim of identifying the origin of acidic deposition observed in Japan. Tellurium content in wet and dry deposition samples was determined for four years from March 1993 to March 1997 at two sampling stations in Toyama Prefecture near the Sea of Japan and 5 sampling stations in Tokyo and the surrounding area on the eastern Japanese coast. The average concentration of Te in rainwater of Toyama Prefecture was significantly higher than that observed in rainwater collected at the eastern Japanese coastal sampling stations. The concentrations of Te measured in a station of Toyama Prefecture was found to be significantly correlated with those of sulfate ions (correlation coefficients.528), hydrogen ions (0.571). non-sea salt (nss) sulfate ions (0.483)( $p < 0.001$ ) indicating that the Te has a strong correlation with sulfate ions, produced by coal combustion. Statistical analyses showed the effectiveness of Te as a tracer of long-range transportation of airborne pollutants emitted by coal combustion. Back trajectory analyses based on climatological data at 700 hPa level suggested that the high concentrations of Te in Toyama Prefecture was caused by coal combustion in China. Another back trajectory analyses also demonstrated that an air mass with high concentrations of Te (29ppt) was coming through China, even during the rainy season.

**Key words:** effluent, acid deposition, back trajectory analyses, sulfur dioxide

**EFFECT OF PLANT EXTRACT AND MICROBIAL ANTAGONISTS ON THE  
INCIDENCE OF TOMATO WILT DISEASE CAUSED BY**

***Ralstonia solanacearum***

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**ABSTRACT**

The effect of plant extract and microbial antagonist on the incidence of tomato wilt disease caused by *R. solanacearum*, was evaluated under field conditions. A formulated plant extract (Biota-L), a microbial antagonist (Persada), *P. fluorescens* isolates and *Bacillus* sp. were examined using randomized block design with three replications.

Bacterial isolates of *Bacillus* sp, *P. fluorescens* and Biota-L significantly decreased the incidence of tomato wilt disease, while Agrimycin, Persada and a combination of Biota-L with other microbial agents showed non-significant effects. All of the treatments suppressed significantly the *R. solanacearum* population in the soil. The application of Biota-L as a single treatment or in combination with *P. fluorescens* or Persada did not produce any significant effect on the pathogen. A significant suppressing effect was produced by the combination of Biota-L and *Bacillus* sp. compared to any of the single treatments. This synergism affected the *R. solanacearum* population in the soil but not on the wilt disease incidence. Most of the treatments, except for the combination of Biota-L and *Bacillus* sp. suppressed the soil bacteria, fungi and actinomycetes population.

**Key words:** biocontrol, antagonist, Biota-L, Persada