

Vegetables are becoming a major potential source of nutrition and income for farming families; their production for home consumption and for the market should be fully exploited in all rural development strategies.

This booklet covers the practical aspects of growing vegetables under arid conditions, where special techniques must be applied to obtain acceptable yields. The brochure serves as an instruction manual for extension workers and a do-it-yourself guide for the farming family itself.

The information contained herein is based on several years of experience in vegetable growing in arid regions. All techniques contained in this manual were tried and tested in the Al Boun Project, Yemen Arab Republic.

This book gives some basic techniques which are very similar for all regions. It should help village-level workers to advise smallholders and the farmers themselves under smallholder conditions.

## IX SEED PRODUCTION

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### Seed production

Review, book, seed production technology, ICARDA, practical guide, seed procedures, processing, marketing, distribution, agricultural policy

SRIVASTAVA, J.P. and SIMARSKI, L.T.

Seed production technology.

International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria, P.O.B. 5466, 1986, 287 pp.

Quality seeds of improved varieties are the key to agricultural progress. The production potential and other desirable characteristics of seed set the limits on production. Other inputs such as fertilizers, pesticides, herbicides and overall crop management help to realize the production potential of seeds. Seed has been an important agriculture commodity since crops were first domesticated. Part of the success of a farmer's crop depends on the quality of seed he plants. Even good management cannot produce good yields from a low-yielding, unadapted variety. If the farmer plants a mixture of disease-susceptible varieties with different crop durations and plant heights, his yields will be low and the diseased plants may contaminate his entire harvest. If his seed has low viability, the plant stand will be poor. Similarly, if his seeds are mixed with inert matter of weed seeds, his crop will be infested with weeds and yields will go down.

Farmers are gradually becoming seed-conscious and are willing to pay higher prices for quality seed of improved varieties. The seed industry covers a broad range of activities such as improvement, production and certification. Seed quality control, processing and marketing also form integral parts of the seed production infrastructure.

The information in this practical guide for seed producers and technologists has been distilled from two sources: the experience of the national research programs of the Middle East and North Africa, and the expertise of those who have conducted seed technology training courses in the region. The book is intended as a reference for all concerned with seed production, processing, marketing and distribution, as well as for agricultural policy makers.

The first section of the book gives an overview of the seed production situation in the region, and outlines the components of a seed production industry. The case studies that follow illustrate how seed industries have developed in different countries. The bulk of the book is devoted to techniques and methods for seed production, including the certification, testing, processing, storage and marketing of seed. Producing seed of the crops on which ICARDA concentrates has special problems, which are addressed in the final section.

This book is a sound basis for those involved seed production. The authors produced a valuable practical handbook for seed producers and technicians.

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## Seed production

Review, book, seed potato production, in vitro culture, rapid multiplication techniques

JOERDENS-ROETTGER, D.

Seed potato production in the Philippines: in vitro culture and rapid multiplication techniques.

GTZ, Eschborn, 1987, 113 pp., ISBN 3-88085-347-9; distributor: TZ-Verlagsgesellschaft mbH, Postfach 36, D-6101 Roßdorf 1, FRG

The potato as a food crop is gaining importance in developing countries. One of the major bottlenecks to expansion of production is the lack of healthy seed material affordable to even small farmers. Traditional methods of seed potato production are expensive, slow and complicated from the technical point of view. They also pose management problems in an agricultural environment in which small farms dominate.

As an alternative to the traditional seed propagation of potatoes, modern biotechnology methods for clonal propagation were developed with enormous multiplication rates. Because of their flexibility, rapid multiplication techniques both in vivo and in vitro can be adapted to all types of seed production schemes. They also offer possibilities for introducing a production system where farmers are less dependent on seed potato supply.

The work presented in this book was undertaken within the framework of the bilateral Philippine-German Seed Potato Project, involving cooperation between the Philippine Bureau of Plant Industry, an agency of the Ministry for Agriculture and Food, and the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). This publication reports how such a rapid multiplication scheme was implemented in the Philippines. It is a manual for agricultural technicians and administrators and encourages them to evaluate alternative seed strategies utilizing this new technology.

This is an excellent example how new technologies can be published. Particularly the practical layout of this book with many demonstrations, figures and pictures are highly appreciated. This book is therefore highly recommended.

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## Seed production

Review, booklet, technical information bulletin, CIP, seed improvement, seed plot technique, on-farm technology

BRYAN, J.E.

On-farm seed improvement by potato seed plot technique.

Technical Information Bulletin, No. 7, Centro International de la Papa (CIP), Lima, Peru, Apartado 5669, 1981

A potato grower can produce his own improved seed tubers and obtain a better crop through a planned process of selection. The seed plot technique is especially useful in the absence of an official seed program.

The objective is to improve the grower's seed stock by selecting the best plants from the current potato crop, storing the tubers from these selections separately, and using them the following season to plant the seed plot. The process is repeated each cropping season by selecting the best plants from the current seed plot for the new seed plot. The remaining tubers of the current seed plot are used as seed for the farmer's normal potato crop. The selection process does not require roguing, although roguing would improve the method's efficiency. The major requirement is ability of the grower to recognize symptoms of yield-reducing diseases. Such ability enhances selection of healthy plants. CIP's Technical Information Bulletins constitute one of several categories of CIP technical information. Their principal objective is to provide any type of agricultural program with technical information on all aspects of the potato industry to support transfer of technology from and to farmers' fields. The information is destined for an intermediate professional level, but is written in a form that it is easily adaptable to the farmers' level. The publications are open for any type of application.

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## Seed production

Review, proceedings, global workshop, propagation, root and tuber crops

COCK, J.H.

Global workshop on root and tuber crops propagation.

Proc. of a Regional Workshop, Apto. Aereó 67-13, Cali, Colombia, 1985, 236 pp.

Many farmers, especially in developing countries, are not yet using good quality seed, despite its obvious advantages. One of the major reasons for this is that farmers are slow to change from the ancient practice of setting aside part of their crop, more or less non-selectively, as seed for the next, to the more recent idea of saving planting material only from the more vigorous and healthy plants. However, in order to produce good quality planting material in small-scale and subsistence agriculture, it is very important that this latter idea become integrated into farmers' practices.

The term 'seed' is used to denote true botanical seed, tubers, roots or other plant parts. Since root and tuber crops are exclusively multiplied by vegetative propagation, this is the meaning of seed commonly used in this publication. Without good seed, the impact of other inputs on yield, such as fertilizer and soil preparation, will not be as significant or as economical. In addition, good seed can be adapted to small as well as large farms, and it is responsive even under less favorable climatic conditions.

The following main recommendations and conclusions were given as an outcome of the workshop:

The tropical root and tuber crops are normally propagated asexually. They are generally easy to propagate; however, rates of multiplication are low and storage is difficult. In addition, the propagating material is often an effective carrier of diseases and pests.

In order to set up a successful seed certification or rapid propagation program, it is necessary to define the varieties or cultivars to be used.

When new varieties are to be released, it is important to involve farmers in the final stages of selection and evaluation to ensure that they do not reject the variety after considerable time, effort and expense have been devoted to its propagation. The performance of the 'best' variety in a multilocal uniform-yield trial is often used to select the variety to be rapidly propagated. A preferable practice is to select and multiply the best variety for each locality, rather than a good average one. Techniques such as in vitro micropropagation are normally thought of as being highly sophisticated, requiring well-equipped laboratories and trained staff. Although this may be true for certain aspects of micropropagation, it must be emphasized that these techniques can also be effectively used at the village level. In order to produce high-quality propagation material, it is advisable to set up special production plots. In general, these should be isolated from commercial production zones or fields, and should be located in areas that allow reasonable propagation rates and low degeneration rates of planting material. The final phases of propagation may be done in farmers' fields, with rapid propagation techniques being used for the earlier stages of multiplication. In crops with a very low propagation rate (e.g. yams), rapid propagation may be required right up to the stage when the material is planted by farmers; whereas in crops with a faster multiplication rate, rapid propagation is only required to produce basic seed stocks. When these are being built up, or whenever field propagation is practised, the use of positive selection of healthy, high-yielding plants (rather than negative selection or roguing) is strongly recommended. Storage is an extremely important part of any propagation scheme. Both the methods and the length of storage can have marked effects on the subsequent establishment and productivity of the crop. Little is known at present about the manner in which different environmental conditions during the growth of the mother plants affect the subsequent growth and development of the progeny. Furthermore, the impact of different levels of seed quality on production is poorly defined. In order to increase the use of good quality seed, it is first necessary to make farmers aware of its advantages, and then to stimulate them to cooperate; for without their cooperation, programs aimed at reducing pathogen levels are likely to fail, and government support for the seed programs will not be promoted.

#### Seed production

Review, book, Southeast Asia, seed production, genetic erosion, breeding, Green Revolution, high yielding varieties, genetic conservation

SAHABAT ALAM

Seed and food security .

Sahabat Alam Malaysia, 37, Long Birch, Penang, Malaysia, 1984, 85 pp., ISBN 967-99942-3-6, US\$ 3.00

The book focuses on the less-known consequences of the Green Revolution, i.e. the increasing dependency of our nutrition on a decreasing genetic base; the increasing monopoly by transnational corporations and the dangers of increasing monocropping of limited numbers of varieties. With case studies from Malaysia, Philippines and India, and reprints of articles by such acknowledged writers as Patrick Mooney (The Law of the Seed), Francis Moore Lappe and Joseph Collins (Food First), the book gives a good summary of the impact and dangers of the situation. In the last chapter 'Fighting the seed revolution', several recommendations are given to take action at international, national and non-governmental levels. Abstract from Agrecol/ILEIA

#### Seed production

Review, book, ICARDA, seed production course, seed technology, training, special seed project

VAN GASTEL, A.J.G. and KERLEY, J.

Quality seed production.

ICARDA, P.O.B. 5466, Aleppo, Syria, 1988, 185 pp.

In 1985, an ICARDA special seed project "Development of National Seed Production Organizations" was initiated. The project emphasizes training and is funded by the governments of the Netherlands and the Federal Republic of Germany (GTZ). Since the initiation of the project, several seed technology courses have been organized. The genesis of this book was ICARDA's Seed Technology Course held in March 1986 in Egypt. The course was attended by seed technologists from the Nile Valley countries, Egypt, Ethiopia and Sudan. ICARDA is working hand-in-hand with national programs and seed companies to increase the quantity and quality of seed that is available to farmers. The center, in addition to its courses, produces reference books, and works to increase communication among seed specialists in the region.

This book is part of that process. The papers in this manual were presented during the Seed Technology Course, held 15-30 March 1986 in Cairo, Egypt. The course dealt intensively with seed production in Egypt, Sudan and Ethiopia, and was intended primarily for scientists and technicians, such as seed analysts and seed inspectors, who are working with seed production on a practical level in these countries.

This volume, which includes only a selection of the papers presented during the course, is intended to meet specific needs. The first sections of the book deal with seed production technology. The papers in the last sections of this book provide an overview of seed production activities in Egypt, Sudan and Ethiopia. The papers deal with seed production of specific crops and with the history, progress and constraints to seed production in these countries.

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## Seed production

Tropics, subtropics, review, book, AVRDC, breeding, seed production, Chinese cabbage

OPENA, R.T., KUO, C.G. and YOON, J.Y.

Breeding and seed production of chinese cabbage in the tropics and subtropics.

Technical Bulletin, No. 17, AVRDC, Shanhua, Tainan, Taiwan, 92 pp., ISBN 92-9058-032-1

Heading Chinese cabbage (*Brassica campestris* subsp. *pekinensis*) is traditionally a crop of the temperate zones where it grows well under cool, dry climatic conditions. It is most popular in temperate East Asia, where it ranks as one of the most important vegetables.

In the tropics, the production of heading Chinese cabbage is confined mainly to the highland areas. When grown in the lowland tropics, this vegetable fails to form marketable heads and easily succumbs to several debilitating diseases.

The successful growing of heading Chinese cabbage in the hot, humid tropics was not feasible until the advent of the heat-tolerant, tropically-adapted cultivars. These improved varieties resulted from the painstaking crop improvement research which commenced in 1972 at the Asian Vegetable Research and Development Center (AVRDC).

The seed production dilemma in the tropics is not one without a technological solution. While Chinese cabbage is largely 'temperate' in its requirements for flowering and seed production, the tropically adapted cultivars do not require very low temperatures for flowering induction. Successful seed production of these cultivars has been demonstrated in the highlands of the Philippines and Indonesia. Indeed, it is not far-fetched to expect that other tropical countries interested in developing their own seed production program for the tropical cultivars could very easily do so given the following: availability of relatively cool, dry highland climate; trained and skilled cadre of seed production specialists; and, appropriate technology for seed production.

The present bulletin was prepared as part of AVRDC's continuing commitment to technology transfer to the national programs. It is intended mainly to provide the seed production specialists in the national programs with the fundamental guidelines for producing Chinese cabbage seeds in the tropics.

This bulletin is therefore aimed at imparting the basic principles which underlie the breeding of a cross-pollinated crop like Chinese cabbage; more specifically, its improvement for tolerance to the major stresses of the humid tropics is an important consideration in this publication. This bulletin could also serve as a special reference on Chinese cabbage, especially in the aspects of its evolution, its biosystematic relationship with the other Brassica species, its general botany, the genetics and physiology of self-incompatibility, and other related subjects. This bulletin is the culmination of over a decade-long research endeavor by all AVRDC scientists to bring the Chinese cabbage within reach of tropical vegetable farmers. This technological feat has been accomplished. The book is a "must" for all those involved in seed production of chinese cabbage.