

VIII HOMEGARDENS

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Homegardens

Review, tropics, subtropics, homegardens, nutrition
REIS, B. and LEITZMANN, C.

The contribution of the home garden towards improving nutrition in the tropics and subtropics.

Plant Research and Development, 24, 1986, pp. 70-78

The rural population of tropical and subtropical countries lives predominantly on plant-derived food. Food constituents such as protein, vitamin A and iron which could easily be supplied by animal-derived foods are therefore often not available in sufficient quantities. Vegetables grown in the garden can make an important contribution to improving nutrition in developing countries. They introduce more variety into the daily diet and enrich it with valuable vitamins and minerals. The regular consumption of vegetables can help to prevent vitamin A deficiency and anaemia.

Advice needs to be given on both nutritional and horticultural questions so that the nutritional value of vegetables and the best ways of growing them may be appreciated. Isolated measures do not necessarily result in an improvement in the nutrition of rural populations.

Development aid in the field of agriculture is primarily directed toward increasing food production and thus improving the income of rural households. In many cases, this may be a sensible approach but it does not always improve the food situation of the local population at the same time. There is a need therefore to proceed in ways that will directly improve the dietary situation. Agriculture directed toward economic aims usually results in too much specialization and thus to a restriction in the variety of food plants traditionally cultivated. Little thought is given to the effect this may have on the diet. Providing a varied selection of foods is the best way of ensuring the supply of all the nutrients necessary to life. Faulty nutrition is the likely result of restricting the diet to a few foods. Proper nutrition ensures physical and mental development and also efficiency and a willingness to work.

Growing a variety of vegetables in the garden is one way of reaching this goal. Vegetables introduce variety into the daily diet, supply valuable vitamins and minerals, and are relatively easy to grow. At present, the best use is not being made of the potential of the home garden in developing countries.

Any piece of land with one or more kinds of useful plants growing close to a settlement can be described as a home garden. The idea here is that the immediate surroundings of the dwelling should be used to produce additional food. Kitchen wastes can also be used as compost and animal droppings as manure, with good effect. Smaller areas or corners are mostly used to grow vegetables and also herbs and fruit. Vegetables are the edible parts of a plant

and are mainly eaten as accompaniments. They can be divided into the following groups, depending on which part of the plant is used:

- leaf vegetable, e.g. cabbages, spinach, amaranthus
- fruit vegetables, e.g. tomatoes, red peppers, okra
- root vegetables, e.g. carrots, salsify
- tubers, e.g. potatoes, manioc
- legumes, e.g. beans, peas, lentils, vetches.

Of these different kinds of vegetables, it is mainly the fruit and green vegetables that are grown in home gardens and not so much the typical basic foods. The protein-rich and therefore valuable legumes have often been the subject of nutritional investigations. For this reason emphasis is placed on the fruit and leaf vegetables in this paper.

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Homegardens

Review, book, agriculture, homegardens, compost, management, methods, uses

MUSTIN, M.

Le compost: gestion de la matière organique (Compost: management of organic matter).

Ed. F. Dubusc, 1987, pp. 956

The "bible" of composting has at last appeared. Indeed, it is the first synthesis on this subject in which nothing has been omitted: theories and practices of composting, agricultural and non-agricultural valorizations (e.g. production of energy, purification, clearing of pollution), thorough knowledge of the techniques in tropical and temperate regions, compost by the professional and the amateur gardener.

A common utilization program for all the organic wastes and all the techniques of composting allows comparisons and, thus, a judicious choice for each case - a quite complicated process. A feedback to utilization of simple principles and calculation of proportions, of chronology, or correct dosage, helps to consider the cases which have not been treated explicitly.

This vast panorama of technical and practical principles about management of organic matter will be of great help to any reader, from the agriculturist to the industrialist and to everybody in search of reliable basic scientific information on composting.

Abstract from Alternatives Agricoles (GEYSER)

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Homegardens

Review, book, tropics, vegetables, principles, practices

TINDALL, H.D.

Vegetables in the tropics.

MacMillan Press, Westport, Connecticut, USA, AVC Technical Books, 1983, 533 pp., ISBN 0-333-24266-1, US\$ 39.50

This handbook is intended to provide a comprehensive account of the principles and practices currently in use for growing vegetables in the tropics, so that students, growers, extension officers, research workers and administrators can appreciate the potential that exists for increasing the production of vegetable crops in tropical regions. An introductory section includes notes on environmental factors and plant growth (especially climatic factors and soils) and cultural practices. The major part of the book is devoted to an illustrated account of over 135 kinds of vegetables in alphabetical order of family, genus and species. The information on these includes Latin names (with synonyms), common names, cultivars, center of origin, distribution, areas of cultivation, botanical description, environmental response, cultural requirements, growth period, harvesting, preparation for market, storage, uses, nutritional composition, pests, and diseases. Cultivars and pests and diseases (and their control) are dealt with in appendices. Indexes by Latin and common names are provided, and in addition to a select bibliography for the whole volume, there is a list of references for each plant family.

Abstract from CAB

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Homegardens

Review, tropical homegardens, perennials, annuals, crop-tree-animal

FERNANDES, E.C.M. and NAIR, P.K.R.

An evaluation of the structure and function of tropical homegardens.

Agric. Systems, 21, 1986, pp. 279-310

Homegardens represent land-use systems involving deliberate management of multipurpose trees and shrubs in intimate association with annual and perennial agricultural crops and, invariably, livestock, within the compounds of individual houses, the whole crop-tree-animal unit being intensively managed by family labor. Known by different names in various places, these agroforestry systems are common in all ecological regions of the tropics and subtropics, especially in humid lowlands with high population density.

An analysis of the structural and functional aspects of ten selected homegarden systems from different ecological and geographical regions shows that the average size of the homegarden units is less than 0.5 ha; yet they are composed of a large number of woody and herbaceous species, carefully structured to form 3-5 vertical canopy strata, with each component having a specific place as well as function.

Food production is the primary function of most homegardens, the vast majority of them being subsistence production systems. While there is a remarkable similarity among the different homegardens with respect to the type and nature of the herbaceous crops, the nature of woody perennials varies, depending on environmental and

ecological factors. In general, most woody components produce fruits or other types of food in addition to other outputs such as fuelwood, timber etc. These various food products provide a substantial proportion of the nutritive and energy requirements of the local diet. Moreover, the species diversity and varying production cycles of the different components ensure continuous production throughout the year from the homegarden unit. Little or no research has been done to improve homegarden systems. Structural complexity, species diversity, multiple output nature, tremendous variability from farm to farm etc., are some of the main characteristics that make the homegardens extremely difficult models to work with, according to the currently available research procedures.

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Homegardens

Review, handbook, humid, tropics, review, homegardens, mixed gardening

SOMMERS, P.

The UNICEF home garden handbook - for people promoting mixed gardening in the humid tropics.

UNICEF, 1985, 55 pp.

Homegardens are not without their constraints: shortage of available land, inadequate water supply, lack of seed or a seedling supply system etc. On the other hand, they can provide food to those who need it, and they can provide income as well as fuel, medicines and materials for household articles. Equally important, they offer opportunities for families and communities to improve their daily lives by building on traditional gardening practices developed through long experience of their own environments.

Any program of rural development must take into account the importance of the homegarden in rural life. A framework for introducing homegardens or modifying those that already exist must be planned very carefully so that it truly meets the needs of the local people. Past programs have emphasized the physical/technical problems inherent in promoting homegardens or increasing their outputs. It was assumed that the people lacked skills in gardening and that through the adoption of Western gardening techniques, accompanied by advice and support, gardens would abound and flourish. However, research has shown that success cannot be achieved if only the technical aspects are considered. Social and economic factors are vital, and people embarking on a homegarden program must recognize their importance if the program is to be effective.

The overall objective of this handbook is to introduce the reader to a traditional system of family food production that has proved itself over the centuries, and to provide guidelines to assist program officers in devising and implementing an appropriate homegarden program. The information is presented in two parts: first, a general explanation of the homegarden, its importance, structure and uses; and second, a more detailed set of guidelines for estab-

lishing a homegarden program, together with practical suggestions for putting the program into effect at the village level. For two years, the author observed and worked with indigenous homegarden systems throughout rural Southeast Asia, and especially in the Philippines. However, the techniques and objectives discussed here could be equally applicable to programs for improved nutrition in all countries of the lowland humid tropics.

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Homegardens

Review, homegardens, less developed countries
BITTENBENDER, H.C.

Home gardens in less developed countries.
Hort. Science, 20, 1985, pp. 645-649

Homegardens are an ancient and widespread agricultural system. Today in the USA and other developed countries (DCs), the homegarden remains as a popular hobby. Horticulture departments in the USA work with home gardeners as one of their land grant university responsibilities. What is the status of homegardens in the less developed countries (LDCs) of Africa, Asia and Latin America? Are homegardens simply hobbies there as well? Can homegardens contribute to the nutritional and household needs of poor families in LDCs? What is the record of past homegarden projects in these countries? Is there a state-of-the-art strategy to improve homegardens? Is there a role for the horticultural scientist? These questions are addressed in this review of homegardens in LDCs, their crops and role in meeting nutritional and other needs of poor families. The design and results of past homegarden projects and two strategies for improving homegardens are evaluated. Recent initiatives by international agencies, e.g. UNICEF and USAID, and the challenge to horticultural scientists also are discussed. Major conclusions are that homegardens make significant contributions to the nutritional and economic wellbeing of families in LDCs. However, quantitative methods are necessary for detailed and reliable information on the productivity and impact of homegardens or homegarden projects on the family's nutritional and economic status. Even without further quantification, a Farming Systems Research and Extension (FSR/E) methodology would improve the design and implementation of homegarden projects. Predetermined or fixed models, whether small or large, lack adaptability by definition, especially when advocated without prior analysis of knowledge and needs of the family. A fixed model therefore may increase the risk to families attempting to implement the recommended changes in their current garden or when starting a garden for the first time. FSR/E methodology applied to homegarden projects would include initial characterization of the community, identifying and grouping potential clientele according to their current gardening practices, conducting research in gardens involving the community's participation and evaluation of results, and dissemination of technology developed within gardens to other members of the community.

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Homegardens

Review, homegardens, research needs, research opportunities
MERGEN, F.

Research opportunities to improve the production of homegardens.
Agroforestry Systems, 5, 1987, pp. 57-67

Homegardens are traditional land-use systems found mostly in the moist tropical world, although some are present in semiarid or arid lands or on steep slopes. They have survived many centuries as a result of adaptations of cultivated plants and cultural practices to ecological conditions. Their roots are in ancient history and they are a modification of land use that had its start during neolithic times.

These traditional systems are characterized by intensive integration of numerous multipurpose trees and shrubs with food crops and animals, all on the same unit of land and at the same time. Frequently, they consist of gardens around individual houses or compounds that are bordered by living fences. There is great diversity in the type of tree, shrub, vegetable and crop species, as well as in the spatial arrangement of these components. Homegardens are characterized by a multistoreyed structure and often contain a pond or rice field. These systems are highly productive and stable systems which require a relative low energy input for establishment and maintenance. The size of these gardens is often as small as one-tenth of an acre, yet they are important components of the nutrition and income of the farmers. Perennial, rather than annual, are the most common type of crop planted in the gardens. The production of edible fruits and vegetables is often staggered, providing a continuous supply of food. The choice of tree and crop species is dictated by the taste and production strategy of the gardener as well as species availability, tolerance for pests, climate and type of soil in the area. Many trees and plants in the gardens are leguminous, adding nitrogen to the site by providing nutrients to the soil through their roots. Trees and shrubs also supply nutritious fodder for livestock, and many species have medicinal or natural pesticide value, or provide spices, oils, nectar for bees, building materials or fuelwood.

The combination of elements in the homegarden forms an effective nutrient cycle which is crucial to the sustainability of the system. Each element has one or more specific functions which serves the various needs of the gardener, and on some occasions cultivars are used. Domesticated animal are important elements in these systems as they feed off the vegetation, and their droppings in turn fertilize the plants. Human, animal and vegetable waste is used for fertilizer or as food for fish or crustaceans in a pond. More research and extension work on homegarden systems is needed to determine the possible benefits of these systems for rural development in many less developed areas. The ecological, as well as the socioeconomic dynamics of these gardens should be studied. Within many of these garden systems, there are a number of plant

lishing a homegarden program, together with practical suggestions for putting the program into effect at the village level. For two years, the author observed and worked with indigenous homegarden systems throughout rural Southeast Asia, and especially in the Philippines. However, the techniques and objectives discussed here could be equally applicable to programs for improved nutrition in all countries of the lowland humid tropics.

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species that have yet to be identified and studied. Research on the genetics, phenology and physiology of these plants, as well as a critical analysis of indigenous practices and knowledge is needed. Tropical homegarden systems can be used as models to preserve endangered species and utilize their genetic potential.

Some of these points are discussed, using specific examples, along with suggestions for research strategies to achieve some of these goals. A sample of homegardens in various geographic regions is described to illustrate the diversity of practices that exist. Most of the systems have been observed and studied in situ by the author over a period of some 16 years.

Homegardens serve as a survival function, and millions of people depend on their successful management to provide a maximum amount of goods and services on a sustained yield basis. Innovative management, based on sound ecological principles, will be the basis for success. Priorities for homegarden studies are detailed below:

- Needed is knowledge about site, soils, irrigation, microclimate, biology and ecology, as well as an understanding of social values that have evolved often through a millenium of practical applications.
- Management is an important aspect of homegarden systems, and the research should not be limited to the area of agroecology, but should incorporate a holistic approach.
- The nutritional values of the animals and plant crops, along with their yields, need to be determined in an effort to maximize the benefits.
- It has been customary in dealing with homegarden research to emphasize ecological aspects and minimize management science (e.g. extension) as an important component.
- If full benefit from homegardens is to be obtained, much more emphasis on modern management and extension practices should be made.
- Many of the meetings of the people interested in homegardens have an abundance of "ecologists" in active participation but a minimum of scientists who could conceptualize this area of applied forestry and agriculture and bring new thoughts into the deliberations. This in no way minimizes the importance of and the potential contribution of biologists, but it points out a lacuna that needs to be considered.
- Homegardens are an important component of the tools of land managers and politicians of the developing world. Experts selected by foreign aid organizations should be aware of these needs, and these foreign aid organizations should attempt to include a holistic philosophy in their programs and accept leadership in providing a more balanced support program for their homegarden activities. By bringing together as many of the disciplines from as many of the interested countries as possible, progress can be optimized. It is thanks to the observant farmers that great progress has been made, and now is the time to invite scientists with other backgrounds to help in improving the yield from homegardens on a sustained yield basis.

Homegardens

Review, book, tropics, homegardens, vegetables, fruits, farmers, extensionists, teachers, basic information, farming practices, recommendations

MACDONALD, J. and LOW, J.

Fruit and vegetables.

Evan Brothers Ltd., ZA Portman Mansions, Chiltern Street, London W1 M1 LE, 1984, ISBN 0-237-50790-0

This book deals with those crops that are grown in a vegetable garden or small orchard. The recommendations given are designed to be applicable throughout the tropics, but since weather conditions and soil will vary considerably, advice should always be sought from local experts, particularly with regard to the best varieties to plant, fertilizer requirements, and pest and disease control. Technical terms that have been used are explained in a glossary at the back of the book. Also included is a list of chemicals and their various trade names to make it easier for farmers to purchase the correct chemicals. The production figures given are for tropical countries only.

This book has been written for agricultural advisors, teachers and farmers who require a reference book that contains basic information about growing crops. There are already a number of agricultural science books available, but these generally do not go into detail concerning essential farming practices. This book attempts to fill this need.

Homegardens

Review, book, homegardens, vegetables, nutrition, vitamins, protein, community participation, tools, soil management, seed, mulch, plant protection

PACEY, A.

Gardening for better nutrition.

Intermediate Technology Publ. Ltd., 9 King Str., London WC2E 8HN, UK, ISBN 0-903031-50-7, 64 pp., 1988, £ 3.78

This is the second in a series of manuals on Socially Appropriate Technology, whose purpose is to discuss technology from the social aspect. In this they differ from nearly all other appropriate technology literature, which describes materials, techniques and principles of technology, but not the practice of technology in specific social circumstances, and rarely the organization of specific technical projects. The subject of this particular manual is the basic technology of horticulture and vegetable growing as it applies mainly to family gardens. Conventional agricultural services, on the whole, encourage commercial crop production without much thought for the nutritional consequences of the policies they advocate. Medical services and other organizations concerned with the high incidence of malnutrition in some countries

have experimented with a different kind of agricultural program aimed at helping those who grow vegetables for immediate use by their own families.

The aim of this manual is to go some way towards redressing this bias by describing alternative kinds of agricultural extension work which are related to forms of gardening and food production with which women are most concerned.

It contains experiences on vegetable cultivation and its extension in different programs aimed at nutrition amelioration. The central chapter treats the choice of different vegetable species of the tropics for a balanced diet, with short directions concerning cultivation and site, and the planning of a new garden. Intercropping and special measures of organic farming are not dealt with. The booklet is a useful introduction to nutrition and gardening for development workers.

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Homegardens

Review, book, homegardens, vegetable, natural methods, nutrition
RENAUD, V.

Le potager par les méthodes naturelles: un trésor de santé (The vegetable garden by natural methods: a treasure of health).
Ed. Ch. Dudouet, F-58 470 Magny-Cours, France, 1988, 472 pp.

The author is both biological gardener and vegetable collector, and his book includes all his knowhow. In this book one can find so many details about chervin, musk chervil, purslane and other (130) known or unknown vegetable crops, and medicinal or aromatic plants. The hasty reader will perhaps find it a little too dense. One piece of advice follows the next. The whole could have been shortened, but the "harvest" is good. No doubt, this publication will have its place in the library of the vegetable curiosity amateur. Thus, many species and cultivars could be saved from disappearing. An original list of seed suppliers is also noteworthy.

Abstract from Agriculture actualité (GEYSER)

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Homegardens

Asia, Philippines, survey, homegardens, workshop, AVRDC, food
production
SOLON, F.S.

Food production through home gardening.

In: AVRDC Publ. No. 87-273, 1988, ISBN 92-9058-028-3, AVRDC,
Shanhua, Taiwan, R.O.C.

Homegardening has been advocated in the Philippines for many decades. Although vegetable consumption by Filipino households has significantly improved over the years, the contribution of home-gardening to this improvement is quite insignificant. Since 1974,

efforts have been intensified to promote practical homegarden technologies in which some breakthroughs have been achieved in some areas of the country.

The 1982 survey of the Food and Nutrition Research Institute (FNRI) showed that 76% of the households participated in food production, only 27% of preschoolers had ideal weights, some are afflicted by night blindness (1.8%) and Bitot's spots (1.4%), and anaemia (26.6%) was present in all age groups. The survey also indicated an increase from 1978 in adequacy levels for energy and vitamin A, but a decrease in protein and iron. Only about 1/3 of the households had adequate protein and energy levels. Of the mean daily per capita intake, vegetables contributed 61% of iron, 39% of calcium, and more of calcium, thiamin, and reboflavin. Despite the relatively significant contribution of green leafy and yellow vegetables to nutrient intake, the average per capita consumption of 12.4 kg/year fell behind the recommended allowance of 32.4 kg/year. This means that about 106 t are needed to meet the national requirements.

Remedies to fill the nutritional gaps have included food sufficiency programs designed to intensify food production at the home level. The Bureau of Agriculture Extension has supplied households with seed and seedlings.

The "magic square" garden technology is composed of vegetables and root crops which are nutritious, inexpensive and easy to grow in a square meter of ground. This garden is also encouraged in schools and in the homes through the school children. Printed materials (manuals, brochures, food prescription pads etc.), the radio (through the "Seeds for Life" program), video tapes, the NCP Nutri-bus and the Barangay Nutrition Scholar are some of the media through which information is being disseminated.

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Homegardens

Asia, AVRDC, homegardens, project, countries, evaluation
MUNGER, H.M.

Evaluation of the AVRDC garden project in three Asian countries.
In: AVRDC Publ. No. 87-273, 1988, ISBN 92-9058, AVRDC, Shanhua,
Taiwan, R.O.C.

The AVRDC gardening project was evaluated mainly by participating in the "Gardening Workshops" held in Thailand and Taiwan from 22 to 26 April 1985.

Impressive progress has been made in the garden technology transfer in Thailand. Families have accepted amaranth and vegetable soybean, showing that people can change food habits to improve their diets. Similar programs have not yet been initiated in Indonesia and the Philippines, but participants from those countries seemed enthusiastic about pushing for funding and government support.

It was decided that the two main needs of the outreach program were training and availability of quality seed. Seeds are currently subsidized by private and government agencies. However, commer-

cial seed companies have to be tapped to take over this job. It is suggested that AVRDC take an active part in the formulation of seed policies and programs.

The author suggested research on nutrition assessment of homegardens, improvement of the food composition table, nutrient absorption, breeding and identifying adapted varieties. Research on soil fertility, water management and pest control were also mentioned.

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Homegardens

Review, homegardens, tropics, agroecosystem, sustainability, model
GLIESSMAN, S.R.

The home garden agroecosystem: a model for developing more sustainable tropical agricultural systems.

In: Proc. of 6th IFOAM Conf., Global Perspectives in Agroecology and Sustainable Agriculture, UC Santa Cruz, 1988, 13 pp.

There has been increasing emphasis on the need to develop more grassroots-based approaches to agricultural development in tropical regions of the world. Such approaches stress the need to combine traditional and local knowledge about agricultural systems and practices with an ecological understanding of how the design and management of the system can lessen dependence on outside inputs, lower environmental impacts of farming practices, and make better long-term economic as well as ecological sense. Such needs have even recently been recognized by major international lending agencies involved in aiding development projects in the Third World.

The agroecosystem that appears to most closely combine all of these important traits is the tropical homegarden system. Probably one of the most complex and interesting agroecosystems, and possibly the one we have most to learn from regarding resource management for a sustainable agriculture, homegardens are found in a concentrated area around the dwellings in most farming systems throughout the tropics and subtropics.

An important aspect common in homegardens is the multiple uses that the various garden elements have. A cash crop such as coconut can also serve as a subsistence food. Some parts are used as fuel, while others are used for construction. Different plants or animals serve as important sources of carbohydrates, protein, vitamins and minerals. For example, the fruit of the mango tree provides an excellent source of vitamins C and A. Due to mixture of species, there is always something ready to be harvested, adding diversity to the diet. Many products can be sold for cash or traded. Variability for flowering and maturing ensures harvest or even sale for income during the entire year.

The function of the homegarden can include such social aesthetic functions as serving as an indicator of the social status of the owner or beautifying or improving the environment directly associated with the house. At the same time, the gardens can play an important role in the economy of rural families.

Generally, the more isolated the dwelling, the greater the emphasis on subsistence crops. In studies in Java it was found that production in local gardens fell considerably during the rice harvest when labor was concentrated on that cash crop, but during the rest of the year, activity in the gardens was quite high. Between 20 and 30% of the annual income of many households was obtained from their homegardens.

The ability of an agroecosystem to respond to different factors or conditions in the environment, to meet the needs of the inhabitants for a great diversity of products and materials, and to respond to external socioeconomic demands, are all very important components of a sustainable system. At the same time, we have become more aware of the need to find ways to lessen dependence on expensive imported agricultural inputs, as well as to limit the environmental impacts of the ways we farm. What we are learning from an agroecosystem such as homegardens is that there are practical, time-tested ways to combine all of these characteristics into manageable, productive, and sustainable farm units.

But more information on the already existing types of homegarden agroecosystems is desperately needed. The rapid move toward urbanization and cash cropping in developing countries is threatening the existence of such local systems. The information presented at the First International Workshop on Tropical Homegardens held in Indonesia in 1985 was a major step forward, and fortunately more such workshops are planned for the near future. The next step is to set up and monitor model homegardens that incorporate traditional knowledge with selected modern agricultural improvements. Two such systems that have attempted such modeling are known from lowland Mexico, but they have suffered from a lack of institutional support that seems to come from a general lack of appreciation in the agricultural research establishment for the potential value of such systems.

The more widespread implementation and improvement of homegarden systems will involve considerable research on the part of ecological, agricultural and social sciences. By applying interdisciplinary research methods, improvement can take place toward reestablishing the much-needed ecological balance that underlies a sustainable agriculture, as well as accommodating the complex socioeconomic interactions that revolve around such systems. But most importantly, much of the basic knowledge of such systems still lies with the traditional farmer.

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Homegardens

Review, book, arid and semiarid zones, vegetable production, techniques, instruction manual, extension, family farming, homegardens
LIPP MANN, D.

Vegetables - for the family and for cash.

GTZ, Eschborn, 76 pp., ISBN 3-88085-275-8; distributor: TZ-Verlagsgesellschaft mbH, Postfach 29, D-6101 Roßdorf 1, FRG

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 or 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.