

A Virtual Training Manual *ON*

ESSENTIAL SKILLS FOR PRODUCTION AND SUPPLYING OF QUALITY SEED IN SUB SAHARAN AFRICA

A training manual giving a clear strategy to increase food and nutrition security and alleviation of poverty through proactive engagement of small and medium private seed enterprises.

Admission criteria: Fluency in English

Minimum number of trainees/participants per course module: 15persons.

Course fees per trainee/participant: US\$700.

Course duration: One week

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Award: At the end of each course module the trainees will be awarded a **Certificate of Participation**.



Introduction:

Development of a workable seed program involves many interrelated factors. The seed Industry in Sub Saharan Africa (SSA) has greatly transformed for the better since the privatization of the sector in the 1980's and targeted funding to the sector. Interest in quality seed is visible in all the countries involved, the number of seed companies continues to grow in all Sub Saharan Africa (SSA) and the

challenge to produce adequate high yielding quality seed to meet the farmers' demands is still far from being addressed effectively. Since 2010, The Seed Enterprise and Management Institute (SEMI) at the University of Nairobi has trained over 1200 personnel from private seed companies and associated government institutions from 22 countries in Sub Saharan Africa (SSA). Due to the popularity of the seed training program, the course modules' contents have **now been translated for virtual/online delivery**. In SEMI at The Nairobi of Nairobi, seven course modules, as described below, constitute the seed training program. In seed production emphasis will be laid on the techniques and practices essential for increasing the tiny quantities of seed obtained from the breeder to the tons needed to make impact at the farmer level. Maintenance of seed quality and good post harvest handling procedures are key because seed must be kept in viable form to produce vigorous plants. The seed training program is made up of 7 modules namely Seed business management, Seed marketing, Seed production, Field Pests and Disease Diagnostics in Seed crops, Seed drying, processing and storage, Seed quality assurance and seed enterprise management and Plant Protection Organizations (NPPOs) quality regulators. The course duration is designed to last one week for six course modules while Seed Quality Assurance and Seed Enterprise Quality Management is for two. The activities planned in this program have been designed to train and develop the capacity to produce quality seed and make it available to the farmers as a top priority in SSA. The program will aim at developing and improving seed expertise and training capacity so as to bridge the identified seed needs of the small-scale farmers, who will be the primary beneficiaries. Training curricula will cover both the seed technology component (production, processing and quality control) as well as the business management of seed companies to make them sustainable.

1. Course module on Seed Business Management

1.0. Introduction

Constant change in our social and economic environment imposes increasing demands on individual and enterprises to seek quality management practices. Many well-financed and designed seed enterprises have collapsed in sub-Saharan Africa due to lack of good business management. Therefore, there is a need to train entrepreneurs in business management skills that are critical to the success of their businesses. Seed enterprise, therefore, like any other business must be properly managed to realize the required benefits to the investor and to customers. Seed business management training encompasses all aspects of business from strategic planning and implementation through to leadership and corporate governance and managing operations, -with emphasis on the value of critical thinking in both financial and human capital areas. Of special importance is the need for team

building to ensure the various stakeholders in the value chain carry out their responsibilities efficiently and effectively.

This course has been designed to allow the participants to acquire strategic management, general management which contributing towards flexibility, strong communication, problem solving, decision making and aptitudes of lifelong learning.

2.0 Overall Objective of the course:

The overall objective of the course is to expose participants to knowledge of sound business practices which will enable them to build healthy and sustainable seed enterprises.

3.0 The participants will acquire:

3.1 Critical thinking skills in general, financial and human resources management in seed business

3.2 Fundamental seed business financial planning, record keeping and analysis skills

3.3 Knowledge in building and managing teams to carry out the essential seed business responsibilities

3.4 Working knowledge of the critical success factors for a seed enterprise, and how to achieve them.

2. Course module on Seed Marketing

1.0 Introduction

Strong seed marketing approaches are essential if the needs of the farmers are to be addressed adequately. Marketing ensures that seed businesses are profitable, sustainable and responsive to the needs of their clientele. This module is designed to specifically address the different aspects of seed marketing within various settings. The participants will be equipped with fundamental marketing and analytical skills that are essential for business sustainability. They will also be exposed to issues related to seed demand and availability, seed market requirements, and the different approaches for farmer product awareness.

2.0 Overall Objective of the course

The overall objective of the course is to enhance participants' knowledge and skills on effective marketing approaches which will enable them to better serve and retain their existing customers and attract new ones.

3.0 The participants will acquire:

3.1 Skills in seed marketing and awareness creation among stakeholders;

3.2 Fundamental marketing planning, information systems,, and analytical skills;

3.3 Skills on effective implementation of seed marketing strategies.

3. Short Course on Seed Production

1.0 Introduction

In the Sub-Saharan region of Africa (SSA), agricultural development plans are assuming a positive upturn as a precursor to industrialization. Acquisition of good quality seed of an improved variety symbolizes the potential to improve agricultural output. Therefore a re-examination of the seed-systems is necessary as a starting point towards agricultural rejuvenation in SSA. Although significant progress has been made to generate new improved crop varieties through research, farmers are yet to benefit fully from these achievements. One of the major reasons for this is the lack of trained personnel with practical skills in the production of quality seed for processing and packaging for wide distribution. The seed production training module is intended to provide an critical knowledge for the management of field seed production of hybrid seeds, open-and self-pollinated crops commonly grown in Africa, such as maize, sorghum, beans, cowpeas, groundnuts and rice. In addition, the training guides learners on production of vegetatively The module will enable the trainees to understand the various aspects of seed production from planning, through field management of seed fields, seed-production-research to managing contracted seed growers.

2.0 Overall Objective of the course

The overall objective of the course is to enhance the participants' practical knowledge and skills for quality seed production and regulatory aspects of seed production in a commercial context.

3.0 The participants will acquire:

3.1 Good understanding of seed production management, regulations of quality assurance to achieve seed production goals.

3.2 Analytical and interactive ability to enable sound planning and implementation of seed production enterprise.

3.3 Ability to diagnose seed production problems and determine and apply practical solutions

3.4 Managerial capacity to design and implement a seed production strategy.

4. Course module on Field Pests and Disease Diagnostics in Seed crops

1. Introduction:

Losses due biotics agents range from 30 to 80% but the regulatory tolerable infection levels for seed crops range from zero to 5 %. The regulatory tolerable limits are based on the fact that seed infection

levels of even 0.1% has potential to cause disease and pest epidemics in the subsequent crop. Seed crops with higher than tolerated levels are condemned and the resulting seed downgraded as food thus leading to loss of marketable seed and subsequent loss of seed market for the affected seed companies. However, many seed company personnel lack skills on identification of diseases and pests and those already trained require re-tooling especially on emerging diseases and new diagnostic techniques. In addition, nutritional and physiological disorders are usually confused with infectious diseases. There is also need to create awareness on the tolerable infection levels set by regulatory agencies for seed crops. The seed production field diagnostics course will emphasize practical aspects such as how to identify and remedy pest, disease and nutritional problems in seed production fields, and in storage. The course will also contain fundamentals of handling soil and water management to enhance seed production.

2.Overall Course objective

The broad objective of the short course module is to equip participants with skills to identify and manage pests, diseases, weeds, nutrient, physiological, genetic and environmental disorders in seed production systems.

3.Participants will acquire:

- 3.1.Better understanding of the components and functions of seed value chains
- 3.2.Better understanding of the importance of the negative effects of insect pests, diseases, weeds, and other disorders in seed production.
- 3.3.Ability to identify important insect pests, diseases, weeds, and other disorders in seed crops
- 3.4.Appreciate/understand the economic threshold levels and regulatory requirements for key insect pests, diseases, weeds, and other disorders in seed crops.
- 3.5.Skills to manage important insect pests, diseases, weeds, and other disorders in seed crops.

5.Course Module on Seed Drying, Processing and Storage

1.0 Introduction

Production is only the first step in the delivery of good quality seed to the farmer. The post-harvest operations including drying, processing and storage are key to the delivery of the seed in good condition. This module is intended to provide an introduction to the basic concepts of seed harvesting, drying, processing and storage for individuals needing a general understanding of related technology. The module will impart knowledge and skills on the post-harvest technical operations

typically utilized to prepare a seed lot for marketing and use. Risks of seed deterioration, mechanical damage and improved seed quality will be emphasized. Methods for selecting and evaluating of seed processing equipment and process output will be reviewed in the context of a typical seed operation for selected crops. In addition, quality control, record keeping, inventory management, and plant layout considerations for various seed applications will be introduced, including special concerns for small lot processing.

2. The overall objective of the course

The overall objective is to equip the participants with practical knowledge of the basic concepts involved in drying, processing and storage operations typically utilized to prepare a seed lot for marketing and use.

3. The participants will acquire knowledge on:

- 3.1. The factors that influence the effectiveness of drying, storage and processing operations.
- 3.2. The concepts, operation and safety of processing equipment and handling system for seeds and other planting materials (vegetative planting materials).
- 3.3. The importance of quality and environmental issues relevant to seed processing.
- 3.4. The relationship between processing operations and other seed production and delivery systems.

6. Course module on Seed Quality Assurance, Management and Control Processes

1. 0. Introduction

The seed systems in Sub-Saharan Africa have to be responsive to the needs of the farmers and the industry must be dynamic enough to bring about the required changes that will make the agricultural sector grow within the existing legal frameworks. Proper maintenance of varieties with improved traits such as high nutritional value, high yielding capacity, and tolerance to biotic and abiotic stresses is necessary in passing the benefits of the bred traits to the farmers. In addition, maintenance of seed quality is essential to ensure that the seeds remain viable and produce vigorous plants. Hence, there is need for continuous testing using the appropriate and approved procedures both in the laboratory. This module is designed to provide the participants with an understanding of procedures in seed certification, laws and regulations governing the seed industry and the standard seed enterprise quality management procedures. In addition, the participants will be exposed to internationally accepted methods of seed testing. The participants trained will be able to enhance

management of small seed enterprises that would produce quality seed for enhanced agricultural productivity in Sub-Saharan Africa.

2.0 The objectives of the course:

The overall objective is to enhance participants' practical knowledge and skills on seed testing, quality assurance and certification procedures.

3.0 The participants will acquire:

3.1 Knowledge on determinants of seed quality and certification process

3.2 Ability to recognize various quality problems associated with seed

3.3 Experiential learning on seed testing methods.

3.4 Knowledge on the role and impact of seed legislation on the seed industry.

3.5 Knowledge on national, regional and international laws, regulations and agreements that facilitate seed production and trade.

3.6 Knowledge on the processes in the management of a quality seed enterprise

3.7 Ability to maintain, interpret and communicate information using ICT for a quality seed enterprise.

7.Course module on National Plant Protection Organizations (NPPOs)

Seed Quality Regulators

1.0. Introduction

The seed systems in sub-Saharan Africa have to be responsive to the needs of the farmers and the industry must be dynamic enough to bring about the required changes that will make the agricultural sector grow within the existing legal frameworks. Knowledge on the rules and regulations governing the seed industry, both in government and private sector is a necessity for the sector practitioners. This module is designed to empower seed-quality regulators and NPPOs on seed quality issues and to learn from established processes in countries such as Kenya. The course will also provide the participants with an understanding of the plant protection and seed legislation, the enforcement necessary, and its impact on the growth of the seed industry, and its benefits to farmers and to agriculture in general. This will be accompanied by a discussion of the law and regulation components as well as the global and regional agreements within the African continent that facilitate seed trade. Free movement and trade in seed especially within SSA is a necessary prerequisite for achievement of a vibrant and responsive seed system that will improve agricultural production. The module will include discussions on accreditation schemes, including the designated authority

requirements and the quality system of the seed enterprise. This will lead to functional accreditation and self-regulation of the seed sector in addition to enhancing capacity of NPPOs and seed regulators.

2.0 Overall Objective of the course:

The overall objective is to equip participants with basic knowledge of Seed quality standards, global best practices in meeting these standards, and facilitation of all seed industry players to meet set standards.

3.0 The participants will acquire knowledge on:

3.1 Phytosanitary, and other seed quality regulations and standards.

3.2 National, regional and international laws, regulations and agreements that facilitate seed production and trade.

3.3 Development and establishment of accreditation schemes, including the designated authority requirements and the quality system of the seed enterprise.

3.4 The procedures involved in seed quality systems and standards worldwide.

3.5 Promoting and supporting self-regulation in the seed industry for sustained high quality seed production and availability.

