

Seed Certification and Quality Control Services in Malawi

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Abstract

The Seed Certification and Quality Control Services Unit is the official seed certification institution in Malawi. Its mandate is to ensure that good quality seed of improved varieties are produced and made available to the farming communities. Introducing specific controls in seed production can result in good quality seed. The process of seed multiplication, and processing, is arranged in such a way that risk of mechanical damage and genetic contamination are avoided; and by setting standards that are to be met at each stage of seed production and constantly checking these against the seeds of crops being grown. To enhance this control measure, therefore, certification is necessary. The formal seed sector is dominated by hybrid maize and tobacco seed and the supply of seed of other important crops that had been limited to the estate sector. Starting from the 1996/97 crop season, the Ministry of Agriculture and Irrigation mobilized individuals, estates and other organizations to produce seed of crops other than maize hybrids and tobacco. So far this initiative has shown to be successful.

Introduction

The Seed Certification and Quality Control Services Unit provides seed certification services and also has a significant component of research and training. The objective of the unit is to ensure that farmers in Malawi are planting high quality seed of all crops. It is not entirely correct, however, to say that high quality seed will automatically be produced by subjecting a seed delivery system to certification. Certification is not a 'pass-fail' phenomenon of seed fields. In fact, seed enterprises that realize the value of producing and selling high quality seed, usually have their own quality control systems. It is essential to have a good co-operation and mutual understanding between a quality control agency and the users of the services.

High quality seed can be produced by controlling seed production. This control can be effected in two ways: (i) seed multiplication and processing is arranged in such a way so as to avoid and minimize the risk of mechanical damage and/or genetic contamination, and (ii) setting up minimum standards against which seed is checked through its production, processing and storage. High quality seed means that it demonstrates an aggregate of the following: (i) high germination rate and vigour; (ii) identifiable and pure, both physically and genetically, (iii) free from seed-borne diseases, and (iv) free from mechanical damage.

Seed Systems

A seed system is a delivery mechanism that puts seed in the hands of the users. A seed system may or may not have a built in mechanism for seed quality control. A seed system largely ensures the availability and not necessarily that the seed is of high quality. Below are some seed systems in Malawi: (i) contractual production, (ii) direct production, (iii) seed imports, and (iv) farmer saved seed.

Contractual Production

This is the arrangement whereby the seed producer provides the parent material as well as seed quality control services to the contract grower. The grower provides land, labour and

any other input other than the parent material, such as the cultural practices to be followed in tobacco. At the end of the season, the seed producer buys the produced seed from the contract grower. The grower may not sell the seed to any other entity other than the party that issued the contract. Seed virtually belongs to the seed producer.

This is the system followed by the seed companies in the country: National Seed Cotton and Milling, PANNAR Seed and Agricultural Research and Extension Trust (ARET). The farmers too are producing hybrid maize, whereas ARET is producing tobacco seed. There could be various modifications to the arrangement but an important characteristic is that the producer does not have land on which to produce the seed but engages others to produce seed on the producer's behalf. Other entities engaged in contract seed production include IRISAT and the Ministry of Agriculture, Action Group II of the Maize Productivity Task Force (MPTF 2).

Direct Production

The producer owns land, sources or buys the start up material, employs labour and carries out all the cultural practices, and pays for seed quality control activities. The producer then harvests, conditions, packs and sells the seed. Although many entities in the country may have the capacity to produce and directly sell the seed, very few entities are engaged in this kind of arrangement probably because seed quality control, processing and packaging and start up material may be difficult to mobilize. With assistance from the European Union, farmers in the country have been formally organized and are producing certified seed. Each farmer is directly producing and selling the seed of crops other than hybrid maize and tobacco. Rather than operating as individuals, the farmers are working as groups, in associations.

Seed Imports

Some seed that is being made available to farmers in the country is imported. Most of the vegetable seed, such as cabbage, tomatoes, rape, spinach, cauliflower and other exotic vegetable seeds, are imported. This is because it is difficult to produce vegetable seed in their areas of production in Malawi. The seed certification and quality control services team has the responsibility of monitoring the quality of seed in the various distribution and retail outlets.

Farmer Saved Seed

Most of the seed used by farmers in Malawi each season is farm saved. Even if farmers may not access certified seed, they will still plant something; and this is what happens in the majority of cases because certified seed is not affordable to most smallholder farmers. Even in this system, there is an element of seed quality control by the farmers themselves because for seed use, they choose produce that looks strong and healthy.

Seed Certification

Seed certification is the process designed to secure, maintain and make available high quality seed and propagation material of superior crop varieties to ensure that desirable quality attributes are not lost. This is achieved through inspections in the field of the standing seed crops, and then later tests are made in the laboratory on representative samples collected from

seed lots to assess the value of seed for planting. Seed certification is performed in five phases, namely verification of land and isolation distance requirements, verification of seed sources, inspection of seed in the field, seed testing and tagging, and labeling.

Current Seed Production Programmes

The formal seed sector in the country has concentrated in the provision of hybrid maize and tobacco seeds. Seed, or planting material, of most of the food crops (OPV maize, groundnut, bean, pigeon pea and sorghum) has been in short supply, and in other instances, not available. To enhance seed availability and supply of these crops to smallholder farmers, the Ministry of Agriculture and Irrigation liberalized the seed market since 1994 allowing for wider participation into the seed sector. Under Action Group II of the Maize Productivity Task Force, smallholder farmers, estates and other organizations were formally mobilized to produce seed of crops other than hybrid maize and tobacco, and this has led to improvements in the accessibility of seed to farmers.

Seed Companies

For the past season (1999/2000), the formal seed sector produced significant amounts of hybrid maize and tobacco seed. The major players in this sector are National Seed Cotton Milling Limited (NSCM), PANNAR and Agricultural Research and Extension Trust (ARET). The seed companies registered the following heceterages for certification.

Hybrid Maize Seed

Maize hybrid seed was mainly produced in estates by Press Agriculture Ltd, in Mchinji and Kasungu. The hectarage passed for NSCM was 590 ha and 73 of MH18 and NSCM 51 respectively. There was a total of 633 hectares passed with total maize seed production of about 2000 metric tones. For PANNAR, substantial production is in the south because it is where their cleaning plant is located. 425 hectares were passed with total maize seed production of about 1200 metric tones. The varieties were PAN 6195, PAN 6363, PAN 6193 and MH 18.

Tobacco Seed

Tobacco seed is produced at Mwimba in Kasungu, Kasama in Chitipa and in a few PAL estates in Mzimba. The varieties of tobacco seed produced were KBM 33, KBM 20, BA1, Coker 347, MTRA 88, MW 86-57 and B84-1052. A total of 10 hectares was passed with seed production of about 2000 metric tones.

Smallholder Seed Production

The Ministry of Agriculture and Irrigation (MAI), with assistance from the European Union, took significant steps starting from the 1996/97 crop season in its efforts to enhance the production of seeds of crops other than hybrid maize and tobacco. It had become quite clear and evident that seed of these other important crops was in very short supply at best, and therefore, there was great need for the Ministry to promote and facilitate seed production by smallholder farmers. For the first time, farmers were given an opportunity to take up certified seed production as a sustainable business endeavour. The farmers are organized in Seed Marketing Action Groups (SMAGs). The SMAGs form associations at ADD level. The eight

associations (one for each ADD) make up the National Smallholder Seed Producers Association (NASSPA), which has the current membership of 2,065. The farmers are producing certified seed of OPV maize, groundnut, soybean, bean, cotton, rice and pigeon pea. Table 1 summarizes the smallholder farmers' seed production under NASSPA during the 1999/2000 crop season.

Table 1: 1999/2000 seed production under NASSPA

Crop	Area (ha)	Production (metric tonnes)
Maize	1149	3500
Rice	50	190
Groundnut	1400	2100
Cotton	43	30
Bean	95	87
Soybean	180	170
Pigeon pea	57	50

MAI Contract Seed Production

To accelerate seed production of crops other than hybrid maize and tobacco, the Ministry has been contracting some entities with large land holding sizes to participate in seed production. The Ministry has been providing the parent material as well as seed quality control activities. Table 2 shows the production level under this programme during the 1999/2000 season.

Table 2: MAI contract programme on seed production

Crop	Area (ha)	Production (metric tonnes)
Groundnut	310	320
Maize	113	4300
Bean	70	70
Pigeonpea	100	101
Soybean	14	15

Seed Testing

One of the greatest frustrations in agriculture is sowing seed that has no capacity to produce an abundant crop of the required variety. Seed testing has been developed to minimize this by assessing the quality of seed before it is sown. Therefore, the ultimate objective of seed testing is to determine the value of seed for planting. Only the germination and purity tests are routinely evaluated. The tests are conducted in the laboratory according to International Seed Testing Association (ISTA) rules while at the same time taking into account the local situation and the dynamics of the seed sector.

During the year under review, quality control tests were conducted on representative samples drawn from seed lots of various crops in ADMARC Markets, Seed Marketing Action Groups (SMAGs) under NASSPA, ARET, NSCM, PANNAR, NGOs, Agricultural Research Programmes, and Import and Export Distribution Centres. The laboratory tests are conducted at Lunyangwa, Lifuwu, Chitedze and Bvumbwe Seed Testing Laboratories. Table 3 summarizes the volume of work carried out in the 1999/2000 crop season.

Table 3: Results of laboratory tests on seed samples, July 1999-August 2000

Crop	No. Samples tested	Samples passed	Samples failed	%Fail
Groundnut	364	329	35	10
Maize	902	773	129	14
Bean	160	156	4	3
Soybean	82	74	8	10
Pigeonpea	23	20	3	12
Cowpea	5	3	2	40
Pearl Millet	3	1	2	67
Sorghum	9	8	1	11
Rice	111	111	0	0
Vegetable	6	6	0	0
Rhodes grass	1	1	0	0
Sunflower	1	1	0	0
Pasture	3	3	0	0
Total	1670	1486	184	-

Testing for Genetically Modified Organisms (GMOs)

Presently, there are no established standards for GMO testing, but testing for the absence or presence of GMOs in seed is becoming more relevant. The tests vary from germination based tests to use the of a strip to polymerise chain reaction. The seed services team is working with a USDA Seed Testing Laboratory in Beltsville, Maryland, USA, specifically on the reproducibility of results, as there will be exchange of results and samples.

Post Harvest Growth Tests or Check Plots

Within the seed certification process, there is need for the certification agency to check the efficiency of its quality control work. This is achieved through the growing out of observation or check plots each season. This involves the establishment of field plots of representative samples drawn from certified seed lots produced in the preceding season. Samples from individual farmers' seed lots are grown separately. The objectives of the programme are: to determine field emergence of the certified seed lots, monitor disease incidence, counter-check field inspection work conducted by seed inspectors, and determine varietal purity. The entries for the season included: rice (Faya, Kilombero, Ntupatupa and Nunkile), soybean (Ocepara 4, Kaleya and Santarosa), maize hybrids (MH 18, NSCM 41, MH 15), and groundnut (CG 7).

Seed Quality Monitoring

In most instances, some seed remains unsold for several years and eventually dies. To safeguard the farmers' interest from buying and substandard seed, unsold, or carryover seed is sampled and re-tested. Substandard seed is withdrawn from the markets and destroyed.

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