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9. SEED LEGISLATION

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Since legislation is above all an expression of government policy, special legislation pertaining to seed is influenced by agricultural policy as a whole. This is compounded of economic aims and social aspirations, and the balance between them is reflected in the seed laws, which are designed to promote better cash returns per hectare and to protect the farmer against the risk of sowing seed of poor quality or of being otherwise exploited.

Another formative influence on the pattern of a nation's seed laws is the government's policy toward private enterprise. The seed industry may be wholly within either the private or the public sector of the economy, or it may be an amalgam of both. In the early stages of a developing seed industry the initiative comes from the government, but it is expected that with progress an increasing part will be played by private enterprise. This chapter assumes the free participation of private enterprise and discusses the restrictions that can be placed on it.

Why is a special seed law necessary?

Quality is much more difficult to judge in seed than in many other forms of merchandise. It is by no means certain that the seed in the bag is of the quality the farmer wants; weed seeds may not be visible and germinative capacity is impossible to assess by eye. Moreover, if a farmer sows seed of poor quality, he stands to lose not only the cost of the seed, but also the whole value of the expected crop and perhaps even a year's livelihood. The law therefore protects the farmer against fraud, negligence, or accident. It also provides some protection to the seller when failure cannot be attributed to the seed or to him. The reputable merchant is protected against unscrupulous competitors to the extent afforded by general law as well.

The seed laws with which we are concerned therefore impose certain restrictions on at least some of the various stages through which seed passes up to the point of sale to the farmer (production, processing, testing, packing, and trading). These restrictions are enforced by penal sanctions.

One of the most effective means of achieving increased production is for farmers to use high-quality seed. This is particularly true if seed of improved varieties is made available to them as quickly as possible. Without proper legislation, farmers risk purchasing seed of inferior quality. A system of controlled production and distribution will minimize this risk.

Certain seed qualities can be assessed by laboratory tests, which take up to a month to complete (for cereals, usually less than ten days). This means that a seed lot which is ready for sale can be sampled and tested; the quality thus established is expected to be maintained for a matter of months in good storage conditions and can be checked at any time by drawing and testing a control sample. Thus control of seed for these verifiable qualities is a relatively simple matter, and the necessary legislation can be quite straightforward.

In general, however, it is not possible to determine the cultivar to which a seed belongs by any laboratory test. Such tests for identifying cultivars by their seed may be developed in the future, and it will then be possible to determine cultivar purity equally as well as specific purity; but in the meantime much more complex measures of control are necessary. Cultivar purity has to be determined by reference to the mother plants from which the seed is to be harvested. This may be done by examination of a plot grown from a sample of the seed used to sow the seed crop and by inspection of the crop on the farm. In practice, crop inspection should be subject to confirmation by plot examination. After crop inspection the seed has to be harvested, stored, processed, and eventually bagged for sale to farmers. These operations are officially supervised to some extent, but for practical reasons never completely; there can be no guarantee that the seed has maintained its identity throughout or that cultivar purity is the same in the bagged seed as it was in the seed crop. Examination of cultivar authenticity therefore requires special procedures and should be the subject of special regulations.

The primary purpose of seed legislation should be to regulate various aspects of the industry — in particular, cultivar listing, seed production, processing, storage, testing, and marketing (including import and export) — with the ultimate aim of making high-quality seed available to farmers in sufficient quantities. Such seed should be:

(*a*) of the most suitable cultivar;
(*b*) of a satisfactory level of varietal purity;
(*c*) of a high degree of analytical purity, particularly with reference to freedom from weed seeds;
(*d*) of a high germinative capacity;
(*e*) as free as possible from seed-borne diseases.

All seed in trade should come under the legislative provisions irrespective of origin, whether it is imported or, if home-produced, intended for sale on the internal market or for export. Seed exchange among farmers not normally trading in seed should be excluded from the provisions of seed laws.

The scope and magnitude of a nation's seed industry can only be decided within the country itself. The basic decision as to whether the industry should be developed either as a joint enterprise of the public and private sectors or exclusively by one sector is likely to be made according to social and political circumstances. In any case, in the "ground-breaking stage" the government will have to take the initiative of starting seed production, control, and distribution programmes. With overall agriculture development an independent seed industry should be encouraged to take over production and distribution of seed. Extension and education programmes may assist in convincing all concerned that good-quality seed is the most vital of all inputs for production.

Minimum standards and labelling requirements

It is generally agreed that seed should be tested when it is ready for sale, to control verifiable qualities, but there are two schools of thought as to how the information from the tests should be allowed to influence subsequent sale to farmers.

In some countries there is no legal ban on the sale of seed however poor the quality may be, but the results of the tests are made available to potential purchasers on labels or invoices or in catalogues. Quality may be expressed either as a percentage or by a grading system. Enforcement officers concentrate on checking the correctness of the information — a method usually referred to as "truth in labelling." It is suitable for countries where farmers are sophisticated enough to understand the information and to judge the quality of seed accordingly. Under these conditions high-quality seed is expected to drive poor-quality seed off the market by competition.

In other countries a minimum standard is set for each attribute, and a ban is enforced on the sale of seed that falls short of any minimum standard. The task of enforcement officers is to check on whether these standards are in fact being complied with. This system is suitable for less sophisticated farming communities; it concentrates on protecting farmers, but at the cost of allowing them no choice.

Modifications of these extremes are followed in certain countries: one sets minimum standards for sale, but the actual test figures are declared,

thus enabling the farmer to exercise some choice; another sets fairly high standards, and seed that fails to reach the standards may be sold only if the actual test figures are declared. While this implies that seed above the standards is of high quality, the farmer is assumed to be sophisticated enough to judge the quality of seed below standards and to buy it if he wishes.

The seeds act

Legislation is enacted in two phases. First, the act, which lays down the general principles and gives the necessary powers to the minister of agriculture, is passed by the legislature. Subsequently, regulations which have the force of law are promulgated by the minister. These provide detailed procedures for enforcing the statute, and they are put into effect and amended as necessary, to keep pace with the development of the seed improvement programme in a way that does not take up valuable parliamentary time.

The seeds act declares the purpose of the legislation and lays down the general principles for achieving it — that is, by laboratory testing, seed certification, restrictions on sale, and either setting minimum standards or following the "truth in labelling" philosophy.

The responsibilities for control and enforcement have to be allocated and delegated very clearly. Under a "truth in labelling" system, sampling and laboratory testing before sale can be left to the merchant. Alternatively, sampling may be done by an official and the test carried out at an official seed-testing station. Between these extremes, sampling and sealing may be done by nonofficials who are specially trained for the purpose.

After sampling and sealing the regulations are enforced by inspectors who visit warehouses, processing plants, merchants' offices, and retail points. They examine records, scrutinize labels, and draw samples from seed lots for testing at an official laboratory. The powers of entry, sampling, and examining records have to be conferred on enforcement officers (Fig. 51).

Procedures have to be prescribed for stopping the sale of seed that is either substandard or wrongly described and for preparing evidence for prosecutions. In particular, it is necessary to state that tolerances on numerical values are admissible. Penalties for offences must also be prescribed. Most important of all, the minister of agriculture must be given powers to promulgate appropriate regulations covering a wide range of detail.

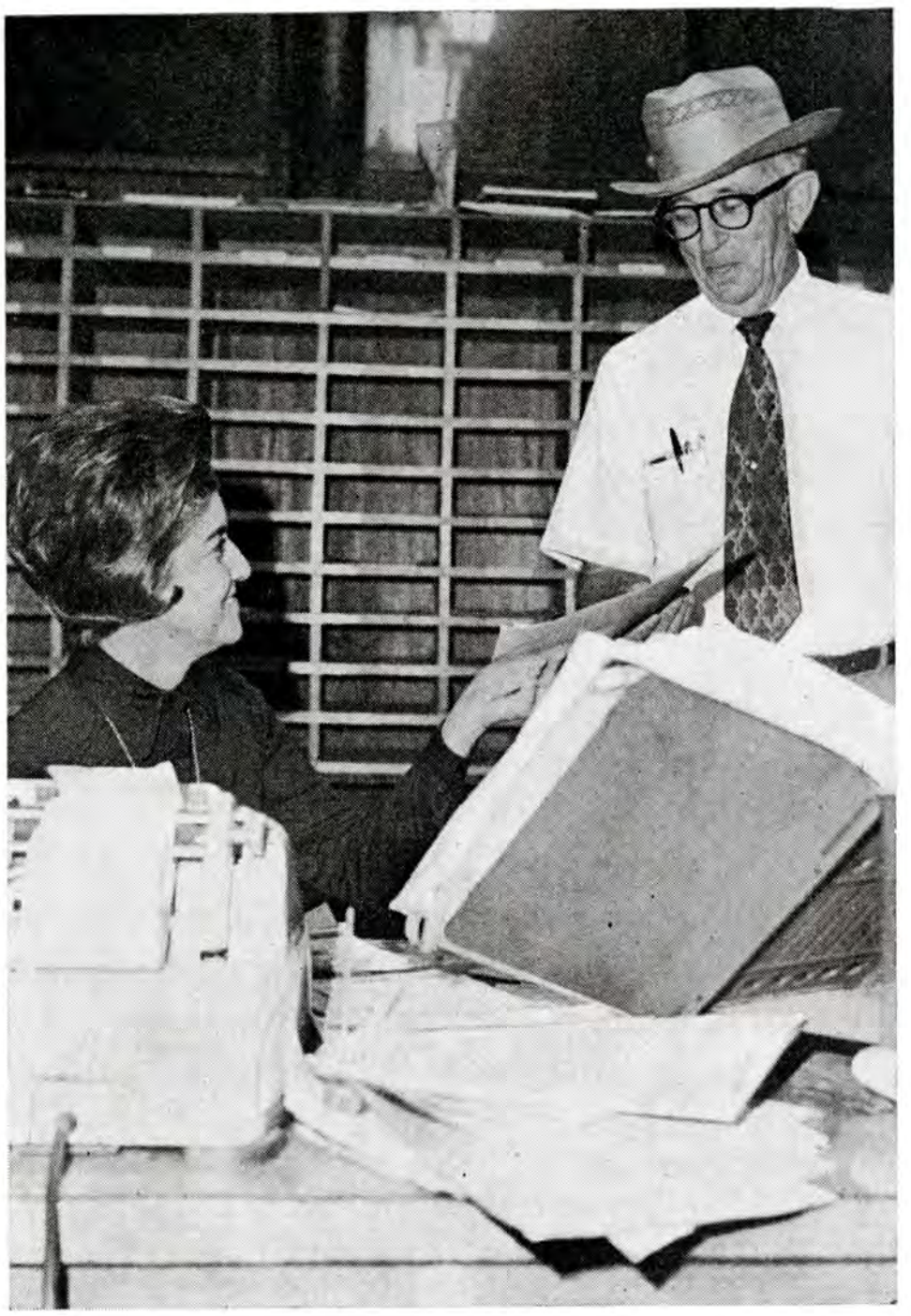

FIGURE 51. Examination of records of activities and operations related to seed.

General regulations

The main features of seed regulations are:

Definitions. Any technical terms used in the regulations (e.g., "fungicide" and "percentage purity") must be defined. In particular, a definition of "seed" is necessary in order to clarify whether the law applies to seed in the botanical sense only or whether it includes plants used for vegetative propagation (e.g., tubers).

Crops. The species to which the act applies must be listed. Minor crops and ornamental plants may be excluded.

Weeds. The species to be regarded as weeds must be specified. A special category of weeds, known as "noxious" weeds, may be established, and

a ban placed on the sale of seed containing such weeds. A weed should not be regarded as noxious for this purpose unless there is strong factual evidence of these three attributes: (*a*) that it is absent from large areas of land; (*b*) that it is normally spread as an impurity in seeds; (*c*) that it is difficult to eradicate once it is established on a farm.

Arrangements for testing. One or more seed testing stations have to be designated as official stations. In addition, nonofficial stations may be authorized to carry out tests under certain specified conditions. To ensure uniformity of test results, it is necessary for all stations in the country to follow the same testing methods. Normally the International Rules for Seed Testing are adopted, sometimes with minor variations to suit local conditions. It should not be necessary, however, to prescribe testing methods in the regulations, because nonofficial laboratories will adopt the methods of the official station in order to avoid discrepancies.

Registration. Sellers of seed and, to some extent, producers, processors, and middlemen will have to be registered and required to keep records, which will be available for inspection. Between countries there are wide differences in the legal requirements in this respect. Regulations on registration are stricter for certified than for commercial seed, and those who register may be required to show their technical capacity and financial status before they are accepted.

Sampling. Reliable methods of sampling must be followed so as to ensure that the test sample is representative of the seed lot. The details specified in regulations should include maximum size of seed lot, size of sample, number of bags to be sampled, position of sampling probe in each bag, and instruments to be used. The methods prescribed in the International Rules for Seed Testing should be followed. The sample should be drawn by an officially designated sampler.

Attributes to be controlled. The verifiable attributes to be controlled comprise at least specific purity, germinative capacity, and weed seed content. Weed seed content may be expressed as percentage by weight or as number of seeds of a certain noxious weed in a specific weight of seed. The number or other crop seeds may also be required (e.g., the number of wheat grains in a kilogram of seed barley). Some countries require determination of moisture content.

The possibility of controlling seed-borne diseases requires careful consideration in the light of local circumstances. It may be worthwhile if a major disease of an economically important crop is in fact seed-borne and if the seed testing station can cope with a large number of disease tests during the busy season.

Labelling. Certain information about the seed has to be given to the buyer. This may be printed on labels attached to the bags or imparted in some other way (e.g., by a certificate). Some items of information are necessary for administration of the control system. Other items give the farmer who buys the seed the technical information he requires. The minimum information required is:

1. Names and addresses of the seller and the person responsible for the information supplied. If the lot was officially sampled, sealed, and labelled, the label should bear the name of the control authority.
2. Reference number of the seed lot.
3. Name of the crop species.
4. Country of origin of the seed.
5. An indication of the quality of the seed. If minimum standards are set, all that is necessary is a statement that the seed has been tested and complies with the standards for purity, germination capacity, weed content, and possibly health and moisture content. If there are no standards, the actual figures obtained in the tests have to be declared.
6. Date and place of tests. A maximum period of validity for tests should be set — say, six or nine months.
7. Chemical treatment, if any, including treatment with fungicides.

Tolerance. Except for minimum standards, tolerance figures for each verifiable quality have to be prescribed.

Imports. Control of imports may be desirable to protect the home seed industry or for quarantine purposes. Otherwise, it is necessary only to ensure that imported seed complies with the law applied to home-produced seed. If already packed for sale to farmers, it must be appropriately sealed and labelled; otherwise, it should be covered by an orange or a green International Analysis Certificate. Quarantine restrictions may refer to seed-borne diseases and pests or to weed seeds. When imposed recklessly, they hinder and distort the legitimate international trade in seed by excluding seed that is adequate for practical purposes. Quarantine may thus inflate the prices of essential seed imports. No country is completely self-supporting in seed. Quarantine should therefore be designed to exclude a very short list of pests, pathogens, and weeds.

Implementation and enforcement

After a seeds act has become law, certain authorities should be designated by and made responsible to the government for implementing the seed

law; they should also be given the necessary powers for this purpose. Facilities, including trained staff, office space, laboratories, and trial fields, should be provided for the designated authorities. The authorities should fix the fees to be charged for the implementation of the law, and these should be announced from time to time in an official gazette. In developing countries, however, where the seed industry is just starting, the charging of fees for activities such as variety listing, field inspection, and laboratory examination of seed may be considered to discourage the implementation of seed production and distribution activities by seed growers and seed dealers.

A limited number of seed inspectors (seed quality control officers) should be appointed to enforce the seed law. A seed inspector must have adequate experience and training to be effective and must be a man of integrity, an educator, an organizer, and one who strives to make better seed available to farmers.

Although seed inspectors should be given a minimum of office space, they must be mobile, since as law enforcement officers they can only be useful to the extent that they are actually contacting sellers of seeds. Other requirements of equipment and supplies for seed inspectors are not great, but they are essential and must be available if the inspector is to be effective. The following is a suggested list of equipment:

1. An identification card or letter of introduction
2. Copies for distribution of the seeds act and rules, as well as other explanatory material about the act
3. Useful references, such as manuals on seed testing, production, certification, and processing
4. A list of the species and varieties covered by the act
5. Printed forms as required under the act
6. Large and small sampling triers
7. Sample pans
8. Sample bags or suitable containers
9. Sealing devices and seals
10. Sample tags

Education is essential to proper enforcement of a seed law. Emphasis should be placed on the development of an effective educational programme directed at the seed inspector, the seed seller, the cultivator, and the extension personnel.

Seed inspectors must be familiar with all aspects and details of the act and the regulations. They should be able to make an inspection and draw samples. They should know the procedures for handling cases of noncompliance with the seeds act and be able to examine complaints.

Seed inspectors should also be familiar with the operation of the certification agency and the working of the testing laboratory.

Seed inspectors, certification agency personnel, and extension specialists are responsible for educating seedsmen and cultivators on all aspects of the seed law and the seed industry.

Seedsmen should know what is required to produce, process, store, and market good-quality seed, how to apply to have seed certified, where and how to have seed tested, and how to test their own seed and decide whether seed is fit for sowing purposes. Seedsmen should also know how to interpret laboratory results and how to transfer such infornation to the label. They should be able to provide specific information on the provisions of the seed law and know what is to be done with seed lots that are unfit for sowing. Special discussion meetings, visits by seed inspectors, and tours and field days are some of the ways in which training and education of seedsmen are accomplished. Publications are also important for this purpose.

Cultivators should know why tested and high-quality seed will be profitable for them, where they can buy certified seed, where they may have their seed tested, and what additional assurances are provided with certified seed. If there is a provision in the seed law for labelling, cultivators should be able to understand what the label means. Special discussion meetings, training programmes, and field days should be organized for cultivators. Newspapers, radio, and television are useful media for disseminating general information on the quality of certified seed. The results of seed surveys are helpful in showing cultivators how their seed can be improved.

Special regulations for the control of cultivars

After legal control of the verifiable attributes of seed has been established and an effective system of seed multiplication has been developed on a voluntary basis, it becomes possible to promulgate regulations for the control of cultivars of the more important crop species. Additional definitions will be necessary (e.g., for "cultivar" and "breeder"). If the general regulations set standards for verifiable qualities, stricter standards may be set for certified seed, such as a higher purity percentage or a lower weed seed count. Labelling requirements will be different; the name of the cultivar and an indication of the stage reached in the multiplication cycle will be required. The control of cultivars may involve (*a*) cultivar listing and release procedures and (*b*) certification schemes. Cultivar listing defines and identifies the cultivar as distinct, as uniform and stable, and sometimes also as suitable for crop production. Certification authen-

ticates individual lots of seed as having been produced in such a way as to keep the seed true to the cultivar name on the label.

Distinctness implies that a new cultivar is distinguishable from any other cultivar on the list, usually by methods suitable for use in a seed certification scheme. Uniformity is necessary for description and identification, but the standard to be expected depends on the mode of reproduction; cultivars are more uniform in a self-pollinated crop such as wheat than in a cross-pollinated crop such as maize. Stability is necessary for ensuring that the cultivar will remain unchanged from year to year.

The name of the cultivar should comply with the International Code of Nomenclature for Cultivated Plants, and a description of the cultivar should be filed at the time of registration. Determination of eligibility requires meticulous examination of botanical characters, both gross and minute; the tests extend over a period of two to three years, using seed supplied by the breeder.

While a cultivar is undergoing distinctness tests, it should be subjected to performance trials on a nationwide scale. The object of these trials is to assess agricultural value, and the results are used to promote acceptance of the best cultivars coming forward by the farming community. One method is to publish the results of the trials and to let the extension service select the best for recommendation. Another method is to add to the list only those that show superiority over the cultivars already on the list; in this case a cultivar should be removed from the list after a prescribed period (say ten years), unless there is evidence that it is still being used to a significant extent.

A cultivar list can be established as either a recommended list or a restrictive list. The former includes cultivars that are suitable for the country and has a purely recommendatory character, meaning that also cultivars not included may be eligible for seed certification and be marketed and grown. In some countries a restrictive list limits seed certification to cultivars included in the list; in others even the sale of unlisted cultivars is forbidden.

Seed regulations may establish a seed certification authority and give it power to operate a seed certification scheme. The authority may be the ministry of agriculture or an agency especially established for the purpose, with a properly established constitution. The governing board may include representatives from the seed and farming industries, but some provision should be made to ensure ultimate government control.