

(1) SEED CERTIFICATION IN THE UNITED STATES

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Seed (2) certification is a program to maintain and make available to the public high quality seeds and propagating materials of genetically distinct crop varieties. Under this program, (3) certified seed is produced by outstanding farmers and seed producers using pedigreed planting stock, careful quality control, field inspections during the growing season, and seed inspections following harvest. Certification is an officially recognized method for maintaining varietal identity of seed on the open market. (4) Consequently, it has become especially important in field crops (except in domestic hybrid corn) because most varieties of field crops traditionally have been publicly released and their seed sold on the open market. It is of lesser importance for other kinds of crops whose varieties are most often privately released and seed production controlled by private companies.

(5) Certification is also widely used for seed destined for international sales. (6) In the United States alone, over 100,000 tons of seed are produced annually for export under the OECD certification program.

(7) HISTORY

Seed certification in the United States and Canada dates back to the early 1900s when the first new varieties appeared from state land grant colleges and government experiment stations. Prior to this, most field crops originated from plant materials introduced from other countries. When new varieties became available, they were distributed to farmers on a haphazard, inefficient, and often inequitable basis. (8) Frequently, such varieties were contaminated, lost or of poor physical quality.

(9) During the period from 1900 to 1920, organizations were set up in various states through which seeds of new 'college-bred' varieties were distributed to farmers. These organizations were often outgrowths of state experiment associations and soon became known as crop improvement associations or seed certification agencies. These agencies were frequently administered by experiment station or extension service staff of the land-grant institutions where they are located.

(10) From 1920 to 1960, under the guidance and influence of the universities, seed certification became an established institution for increasing and making available to the public high-quality seed of improved varieties – varieties that were almost without exception products of the university or government agency breeding programs.

(11) CERTIFICATION TODAY

Seed certification in the United States is the responsibility of each individual state; within each, there is an agency designated to certify seed. (12) Regardless of the agency responsible, the basic authority for certification is derived from the seed law of the individual state. (13) Several states have certification programs administered by state departments of agriculture. (14) In a few states, certification is administered by the Cooperative Extension Service. (15) Most states have certification programs administered by grower-controlled crop improvement associations, although university personnel frequently act as their secretary-managers. (16) In other states a secretary-manager is hired by the board of directors of the crop improvement association. Regardless of how the project is organized, certification programs in the United States and Canada are generally non-profit programs, but must generate funds to cover salaries, overhead, and operating expenses. (17) Ordinarily, even these state agencies maintain close association with university personnel who may serve on their boards of directors.

(18) In Canada, the seed certification program is administered by the Canadian Seed Growers Association, representing pedigreed (certified) seed growers from all Canadian provinces.

(19) THE ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES

The Association of Official Seed Certifying Agencies (AOSCA) is an organization of certification agencies in the United States, Canada, and New Zealand. Its purposes are: (1) to establish minimum standards for genetic purity and recommend minimum standards for the classes of certified seed. (2) to standardize seed certification regulations and procedures. (3) to encourage cooperation with all individuals, agencies, groups, and organizations to accomplish these purposes, and (4) to assist its member agencies in seed promotion, production, and distribution.

(20) The history of AOSCA dates back to 1919, when representatives from Michigan, Minnesota, North Dakota, South Dakota, Wisconsin, and the Canadian Seed Growers Association met in St. Paul, Minnesota to explore the possibilities of developing some type of organization that would be helpful in solving mutual problems. After considerable discussion, a Seed Improvement Federation was proposed, but the group felt that more states should be represented. (21) Another meeting was set for December 1919, at the International Grain and Hay Show in Chicago. At that meeting, 13 states and Canada were represented. and the International Crop Improvement Association (ICIA) was formed, The objectives of the ICIA were to promote the agricultural interests of the

various states as well as the provinces of Canada, emphasizing especially the improvement of field crops in general and seed improvement in particular. (22) These objectives were to be attained by:

1. Encouraging the breeding and improvement of field crops and seeds.
2. Husbanding, propagating, and disseminating elite, registered, certified, and improved seeds.
3. Creating a more active interest in better seeds through circulars, reports, and other publicity as well as by encouraging local state, national and international shows
4. Assisting in the standardization of seed improvement and certification work being done by member agencies.

From the beginning, the ICIA had a major influence on certification throughout the United States and Canada. It has been instrumental in enunciating the fundamental concepts of certification, establishing field and laboratory inspection standards, and encouraging uniformity in certification procedures among its member agencies. (23) Membership in the organization was voluntary, as were its standards and policies; however, almost all certification agencies in both the United States and Canada were members of the ICIA and were greatly influenced by it. In 1968, the name of the ICIA was changed to the Association of Official Seed Certifying Agencies.

(24) THE GENERATION SCHEME OF CERTIFICATION

Inherent in the certification concept is a generation system whereby the pedigree of superior crop varieties is maintained through subsequent seed production. A four generation scheme has been devised to do this, and seed of each generation is identified by a special color labeling tag.

(25) 1. **Breeder seed** is produced under the direct supervision or authorization by the plant breeder and represents the true pedigree of the variety.

(26) 2. **Foundation seed** is the first generation seed from breeder seed and is ordinarily produced under contract by a foundation seed organization as authorized by the plant breeder. Foundation seed is also labeled with white certification tags.

(27) 3. **Registered seed** is the seed from Foundation seed and is intended for the purpose of increasing seed another generation before the production of certified seed. Registered seed is not intended to be a commercial class of seed. It is designated by purple seed tags. In two states (Michigan and Wisconsin), all certified seed is the progeny of foundation seed, and no registered class is used. Most states still maintain the registered generation. However, this class is eliminated in many cross-pollinated crops, particularly with species where seed is produced outside the area of adaptation.

(28) 4. **Certified seed** is produced from foundation or registered seed and represents the final product of the certification program. It is labeled with the familiar blue tag which has become associated with the public image of certification.

(29) Although the four-generation scheme for seed certification has been an integral part of certification since the very beginning, it has not always been applied in the strictest sense. It was not until the mid-1960s that the four-generation concept was adopted in

practice by all certifying agencies. However, many variety developers have elected to restrict some or all of their varieties to a three-class (Breeder, Foundation, Certified) system in order to better maintain varietal purity and assessment of a royalty or research fee.

(30) The Canadian generation system is the same as that in the United States except that there is a *select* class between the breeder and foundation classes for wheat, oats, barley, rye, flax, triticale, buckwheat, field peas, lentils, field beans, faba beans, and soybeans. Breeder seed of these crops is allocated to members of the Canadian Seed Growers Association (CSGA) who have become established as select seed growers after serving a three-year probationary plot- production program. For select status, growers may grow no more than 2.5 acres of one variety of select seed or no more than 5 acres of all crop varieties. The plots must have no more than 1 off-type plant per 20,000 crop plants. (31) Seed from each plot is post-controlled for varietal purity by Agriculture Canada. Select seed may produce select seed for five multiplication before the grower is required to obtain new breeder seed. Select seed is used to produce foundation seed crops which are also post-controlled for varietal purity. (32) A Breeder Seed Crop Certificate is issued by CSCA for the initial increase of breeder seed and each increase made thereafter by the originating plant breeder. Crops of all classes, including breeder seed, are field inspected for varietal purity by Agriculture Canada for the CSGA.

(33) FOUNDATION SEED PRODUCTION

Foundation seed can be thought of as the “vital link between breeder seed produced under the control of the plant breeder and certified seed produced by the certified seed grower. It is the seed stock from which Registered and Certified seed are produced. It is produced by a foundation seed organization, which may be a private association of seed growers, a special project within a university experiment station, or an independent private business.

(34) Foundation seed agencies receive breeder seed of new crop varieties as they are released and increase them to foundation seed. After the initial release of breeder seed, it must be maintained and made available every year. This is done in one of several ways. First, a small portion of the foundation seed field may be designated as eligible for breeder seed production. This area is carefully inspected, rogued of off-types, and classified as breeder seed in cooperation with the experiment station or releasing agency. Thus, foundation seed of annual crops can be maintained on a permanent basis. An alternate, but less frequently used, method is for the releasing institution to grow small lots of breeder seed each year for annual release to the foundation seed organization. For perennial crops, maintenance of breeder seed is much simpler, since small production blocks of each variety can be maintained to provide breeder seed for use in foundation seed regeneration.

(35) If the foundation seed organization does not have adequate production and processing facilities of its own, it may arrange for contract production, which is then made available to registered or certified seed growers after the seed has been cleaned, conditioned, and bagged to the proper standards.

Several factors should be considered when producing foundation seed. (36) First, only the best seed growers with the right combination of experience, land, facilities, and ability are accepted as foundation seed growers. Second, the supply of foundation seed should not exceed the demand. To anticipate demand and provide for foundation seed production calls for advance planning. If excess foundation seed is produced, it must be carried over at extra expense, downgraded to certified seed, sold as commercial grain, or destroyed at a considerable loss. Third, the foundation seed should be available to all certified seed growers on an equitable basis at a reasonable price. When the supply of foundation seed is limited, consideration is given to the growers' production history, their facilities, and their ability to produce high-quality seed.

(37) Although most foundation seed programs operate on a nonprofit basis, they must be self-sustaining. Costs such as labor, overhead, buildings, and conditioning facilities must be covered from the sale of foundation seed – (38) requiring operation on sound business principles. Responsibility for this rests with the manager who is employed to handle day-to-day activities. Often a board of directors is responsible for establishing overall policy and to ensure that the aims and function of the organization are met.

(39) Foundation seed organizations usually have a formal agreement with the state agricultural experiment station which defines the terms of breeder seed release of new crop varieties. Exceptions may occur when foundation seed organizations are private businesses not associated with a university experiment station, or when the foundation seed project is administered by an experiment station staff member.

(40) HOW VARIETIES BECOME ELIGIBLE FOR CERTIFICATION

Varietal Release

Most agronomic varieties have traditionally been released from university experiment stations; however, (41) private seed companies also release new crop varieties. Privately released varieties have long been available for vegetable crops, corn, sorghum, and cotton, and are now common for other field crops.

(42) Regardless of the releasing agency, a procedure must be available for evaluating potential varieties and recommending their release. Most of our experience comes from release by university experiment stations. (43) When plant breeders have a candidate for release, they submit to the appropriate review board a description of their variety, its identifying characteristics, and performance data. It is quite common to submit it first for consideration by a commodity committee comprised of persons closely concerned and familiar with the crop. In experiment stations, this usually involves the plant breeder, a plant pathologist, an entomologist, extension agronomists, and other trained personnel. After favorable action, it often goes to a larger, more formal committee composed of experiment station personnel from disciplines who are responsible for release of new varieties of all crops. The first group provides closer knowledge and involvement with specific crop areas, while the second committee observes uniformity of release procedures and provides perhaps a more objective evaluation of candidates for release. The second committee also advises on specific release procedures and other seed increase matters.

(44) Definition of a Variety

To be eligible for certification, a variety must be properly released, named, and described. In the past, the term *variety* has been simply defined as a “specific close subdivision of a kind with definite distinguishing genetic characteristics that can be maintained or inherited when the plants are reproduced over a period of years.” (45) Because of the different kinds of crops and germplasm available for certification, it has often been unclear whether many candidates for certification actually qualified as varieties. (46) To help clarify this situation, an ad hoc committee representing the United States Department of Agriculture, the Association of Official Seed Certifying Agencies, the American Society of Agronomy, and the American Seed Trade Association, has developed a comprehensive consensus definition of different kinds of varieties. These definitions are published and made available to all concerned organizations.

(47) Varietal Review Boards

Individual certification agencies are aided in determining the eligibility of varieties for certification by national variety review boards which have been established by AOSCA. Four review boards have been established representing alfalfa, grasses, soybeans, and small grains. (48) Each board is composed of six members representing the: (1) American Seed Trade Association, (2) Association of Official Seed Certifying Agencies, (3) Crop Science Society of America, (4) National Council of Commercial Plant Breeders, (5) United States Department of Agriculture, and (6) Agricultural Research Service, USDA.

(49) The functions of the boards are to review and evaluate information presented by breeders of the respective crops in industry and in public agencies who request certification of new varieties and to advise AOSCA on their acceptability as *bona fide* varieties that have been properly released and described. The goal of this arrangement is the acceptance by any member agency for certification of all varieties given favorable action by these boards. However, in actual practice, many individual agencies still require varieties to meet adaptability and performance standards established for their particular state.

(50) CERTIFICATION PROCEDURE

Planting Stock

The proper planting stock is essential for certified seed production. It provides a pedigree, which is central to the certification concept. Certified seed is usually produced from registered seed, although it may be produced from Foundation or breeder seed. Likewise, other classes of seed may be produced from earlier seed generations.

(51) Application

An application for certification must be submitted to the appropriate state or country certifying agency requesting certification as foundation, registered, or certified seed. The application must be accompanied by at least one official tag substantiating the class of seed planted: breeder, foundation, or registered. Each certification agency has its own application procedures that must be followed.

(52) Field inspections

Inspections are performed on all fields for which applications are received. These are timed so that varietal off-types and other crop and weed contamination are most easily detected. (53) In some crops (e.g., clover and alfalfa), a seedling inspection may be required to check for volunteer crop plants. These are normally made a few weeks following seeding. (54) Small grain inspections are normally made after the chaff color has changed, and during the hard dough stage when different chaff color of off-types is most easily distinguished. However, oats are often inspected while the plants are green and the seed is in the soft dough stage. Grass and legume seed fields are usually inspected during pollination, when off-types and weeds are most easily seen and when isolation from adjacent cross-fertile fields is apparent. (55) Table 1 shows the AOSCA genetic standards for several crops. Note that in this table, the cross-pollinated crops must be separated (isolated) specified minimum distances from other fields with which they could potentially outcross. No isolation is required between self-pollinating crops, except for short distances (e.g., 5-10 m) to help prevent mechanical mixing.

(56) Harvesting

A crop is harvested for certified seed in the same way as for other purposes except that more care is given to moisture content, purity, and prevention of mechanical damage. (57) Seed harvested with excessive moisture will not maintain its quality during storage, while excessively dry seed is more susceptible to mechanical injury. (58) Particular attention is directed to thorough cleaning of combine and handling equipment before starting to harvest a field in order to avoid both genetic and mechanical contamination.

(59) Conditioning

All seed must be cleaned thoroughly to remove other crop and weed seed, chaff straw, and other inert matter before it will meet the purity standards for certification in most states. The amount and kind of cleaning depends on the kind of seed and its composition. It is absolutely essential that the conditioning facilities be thoroughly cleaned between seed lots. Although this is a difficult and exacting task, its importance can hardly be overemphasized. (60) Utmost care should be given to avoid mechanical damage during conditioning. Seeds of certain species are especially fragile and must be handled with extreme care. Seed must be elevated at least once to reach the top of the conditioning flow; however, if possible, it should be elevated only once, and gravity should be used to move it through the different steps in cleaning and bagging. The use of augers to move seed should be avoided whenever possible, because they tend to damage the seed, especially that of large-seeded legumes.

(61) Sampling

The sample that is tested for determining seed quality and acceptance for certification is taken after the last conditioning operation. It may be taken by an automatic (mechanical) sampling device, but is more commonly taken from the bagged or bulk seed by hand sampling methods by an official of the certifying agency, however, some agencies permit producers to draw their own samples. The sample should be taken at a time and by a procedure that will yield a sample that will represent accurately the seed to be marketed. If the seed is treated with a fungicide, the submitted sample should be drawn from the treated seed.

(62) Seed Inspection

A sample of the conditioned seed to be certified is tested for purity, germination and noxious weed seed content. (63) Sometimes phytosanitary tests are also required by the certification agency for disease assessment. Whether the analysis is performed by the certification agency or by an official state seed laboratory, it is used to determine whether the lot qualifies for certification. (64) Table 2 shows the suggested nongenetic AOSCA seed quality standards for alfalfa. Unlike genetic standards, they are only suggested standards, and are not required for certification, except when required by the state certification agency.

(65) Seed Tagging

A few certification agencies have a *one-tag* system in which the analysis information (purity, germination, etc.) is printed on the certification tag. However, most agencies have adopted a *two-tag* system, in which the analysis tag and certification tag are different. Some agencies maintain laboratories that determine only if seed meets certification requirements; labeling information is obtained from tests performed in an official state or commercial laboratory. With the two-tag system, the seed quality information can be changed or updated without removing the official blue certification tag.

Regardless of the system used, the tags should be attached in a way that will reveal evidence of any opening, reclosing, or other tampering with the contents of the container. It should be impossible to open the container without breaking or defacing the tag. This is easily accomplished by sewing the tag into the seam or by attaching the tag to the stitching with a metal seal. Metal seals were very common in the early days of certification but are seldom used today.

(66) Marketing

The marketing of certified seed is the responsibility of the producer. It requires both promotion and a reputation for delivering quality, and most experienced growers have established regular customers through which most of their seed is marketed. Many

certification agencies have advertising programs to help promote the image of certified seed and to carry out educational programs in seed improvement.

(67) Many growers avoid marketing problems by growing seed on contract for elevators, seed dealers, or other larger seed growers. The contract may submit the application, pay all certification charges, and even condition, bag, and tag the seed. Normally the grower only plants the seed, harvests the crop, and delivers it to the contractor, although various other arrangements may be used. Contract seed production is becoming more important as smaller growers find it increasingly difficult to compete with larger seed dealers. It is common in the western grass and legume seed production area, which is outside the major area of utilization and requires extensive transportation and marketing arrangements. Contract seed production offers the security of a fair and stable price for the individual seed grower and provides the seed dealer the security of having adequate supplies of seed at competitive prices.

(68) Certified seed may be marketed cooperatively with that of other growers. Successful marketing cooperatives usually have either a unique product, a common geographical location, or some other factor that promotes the common interest of the members and allows them to compete with other seed providers. Furthermore, by group action, they can handle larger volumes, promote their product, offer it at a stable price, and generally be more competitive in the seed market.

(69) Crop improvement associations in North America commonly assess additional fees to provide revenues to support programs to help promote certified seed. Such programs generate funds to promote certified seed in the broadcast and print media as well as other kinds of promotional methods. Such promotion may focus on general advantages of certified seed or be used to promote particular certified varieties. Some are done in cooperation with individual certified seed growers or groups of growers.

Benefits of Certification

(70) **Benefits for the farmer.** There are several benefits for the average farmer in planting certified seed. First, it provides access to seed of excellent varieties with good assurance of high genetic purity. Thus, it helps avoid unnecessary losses in yield from planting seed of unknown or contaminated varieties. Such off-types are likely to yield plants of different maturity, susceptibility to diseases and insects, or be less productive. Similarly, certified seed which is high in mechanical purity provides assurance to the user against the introduction of weeds, diseases or other crop seeds. Contamination by undesirable plants of any kind can reduce productivity and lower crop quality.

(71) **Benefits for Certified Seed Producers.** Historically, only outstanding farmers in each state have produced certified seed on a sustained basis. There are several reasons this in addition to the increased income potential from seed production. They tend to be generally more willing to accept greater effort and timely management required for success. They also recognize the inherent advantage of having early access to new varieties. Finally, they demand the highest quality seed possible for their farming operation and take pride in meeting these demands.

(72) OECD - AN INTERNATIONAL CERTIFICATION PROGRAM

The Organization for Economic Cooperation and Development (OECD) provides a scheme for the varietal certification of seed moving in the international market and is the nearest existing program to a completely international seed certification organization instituted in 1960. The OECD is an outgrowth of the European Economic Cooperation (OEEC) which included membership from several European countries, Japan, and North America. (73) The entire program involves trade agreements, economic expansion, financial stability, and overall economic well-being of the member countries. This program is funded in the United States and Canada by an additional assessment on each unit of seed certified.

(74) Certification under the OECD scheme is on a basis of varietal purity only, and standards have been established to help maintain varietal purity. Requirements include: (1) authentication of the proper planting stock, (2) documentation of previous cropping history, (3) minimum isolation between adjacent seed fields, (4) the number of harvest years during which a field can produce certified seed, and (5) field inspection criteria. As long as the varietal purity is intact, no fields or seed lots are rejected because of nongenetic seed quality factors such as germination and pure seed content.

(75) The OECD has an agreement with the U.S. Agricultural Research Service (ARS) to provide for the program in the United States. State agencies may negotiate a memorandum of agreement for certifying seed according to OECD standards and attaching official OECD certification tags. Ordinarily, this procedure is followed when the seed is to be shipped to another OECD member country. Under this program, thousands of acres of grass and legume seed crops (and hybrid corn) are certified each year in the United States and are sold (usually under contract) by U.S. seed companies to companies in other countries. This is possible because the OECD tag assures that the seed has met internationally recognized standards for genetic purity. The program has greatly aided international trade in seed. (76) Table 3 shows the tonnage of total OECD certified seed produced in 1991/92 and the relative production in different countries. The United States is by far the largest participant in this program and its production is about equally divided between domestic and foreign cultivars.

The OECD certification standards are printed in OECD Publication *Documentation in Food and Agriculture*.

(77) CHANGING CONCEPTS AND SERVICES

From its origin in the early 1900s up to the late 1950s, seed certification was built around three primary concepts: superior varieties, genetic purity, and high seed quality standards. These concepts were seldom criticized or questioned, and over the years, they became almost synonymous with certification. However, in the late 1950s, a reevaluation of this philosophy by the certification agencies greatly changed both the concept and services of certification.

(78) During that period, recommendation and performance standards came under question as valid criteria for certification. Two factors were primarily responsible for this: (1) the volume of seed produced away from the area of consumption, and (2) the appearance of private field crop varieties. Today, evidence of varietal performance

(merit) is usually not a factor in certification. Most agencies will certify a variety that has been properly identified and described by any public or private agency.

(79) Varietal Purity Only (VPO) Certification

One of the more controversial issues to confront certification in the United States was the concept of varietal purity only certification. Under this concept, seed was certified if the field and seed inspection showed the crop to meet minimum standards of varietal purity; seed lots were rejected only for excessive contamination by off-types, inadequate field isolation, or other genetic purity factors. The occurrence of weeds or other crops, disease infestation, or even low germination did not constitute cause for rejection of any field or seed lot. Under the practice of VPO certification consumers are assured of varietal purity by the certification agency and choose seed lots that meet their own seed quality (purity, germination, etc.) criteria on the basis of information on the seed tag. Several state certification agencies have adopted VPO certification, though most still require certified seed to meet minimum seed quality standards.

(80) Certification of Blends

Varietal blends of seed are eligible for certification by several certification agencies. Where this is permitted, all components of the blend must represent certified seed and must be blended in specific, predetermined, and commercially acceptable proportions. The components of the blend are confidential between the producer and the certification agency. Some agencies are reluctant to certify blends on the basis that they do not represent a pure variety.

(81) Sod Certification

Some certification agencies have been certifying turf sod for many years. Certification is usually performed on the basis of elite varietal and mechanical purity of seedstocks, and verification of vegetative varietal composition, freedom from diseases and insects, and absence of weeds and other crop plants. In some states, sod certification is principally for phytosanitary condition.

(82) Tree Seed Certification

Progress in the breeding and improvement of trees has caused an interest in the seed certification of improved tree varieties. Seed orchards of new tree varieties have been established from which certified seed and seedlings are harvested and sold to help establish improved tree stands. Certification agencies have responded to forestry industry requests for help in developing procedures by which customers can be assured of varietal purity and high seed quality. The AOSCA standards include trees, shrubs and native plant species.

Some agencies also certify the source or origin of forest trees and seedlings. This type of certification is performed in the absence of, or as a supplement to, seed from established seed orchards. Certification of the origin of seed is important when it is

desirable to obtain seed from locations of climate, elevation, and exposure similar to the sites where the seed is intended for planting. This assures that the resulting plants will be ecologically suited for the planting site and also ensures their survival and performance.

(83) Phytosanitary Certification

Phytosanitary certification does not qualify as seed certification in the usual meaning of the term. It certifies only that the seed and the field from which it came is free of specified diseases. Phytosanitary certification is normally performed by pathologists from the official government agency, usually the USDA Animal Plant Health Inspection Service, and a tag is attached to specify what has been done. Usually, a phytosanitary certificate is issued for the seed. This enables seed suppliers to provide the certificate to their customers and to officials of the state or country into which the seed is shipped. When seed is shipped internationally, phytosanitary certification is usually required by the receiving country. Most phytosanitary certificates expire within 14 days after shipment of the seed or plant materials.

(84) Ancillary Programs

Many certification agencies also provide traditional certification services. Two of these programs are Identify Preserved and Quality Assurance.

Identity Preserved Programs. The identification and maintenance of genetic purity has been the strength and focus of seed certification programs since their inception. This has enabled improved varieties to be made available to farmers both quickly and efficiently, and has contributed enormously to crop production in the United States and around the world. In recent years, it has become evident that this same expertise could also be extended beyond the farmer level to the consumer and end-user of agricultural grain products. For example, millers of certain types of soybeans prefer high oil varieties and are willing to pay a premium for soybeans that are documented to be of the preferred type. This provides a way to avoid the necessity of the mixing of different varieties or quality levels of grains, oilseeds, or other farm products during storage or marketing. The further development of this concept could provide a valuable service to agriculture and food-related industries which require high levels of product quality and uniformity.

Identity preserved programs for grain products have been established by seed certification agencies in several states. For the most part, these programs utilize the same procedures and practices of conventional certification, including careful record-keeping, field (in some cases), and post-harvest inspections for genetic purity and other aspects of quality, including uniformity.

(85) Quality Assurance. Many certification agencies offer quality assurance programs to the seed industry. These provide field inspection and evaluation services when there is no interest in completing the certification process. This kind of service is used by seed companies that desire the expertise of the certification agency in providing field or laboratory inspections and advice on assuring varietal purity and overall quality. This may include verification of GMO (genetically modified organism) or non GMO status. In many ways, it is not unlike a pest scouting or crop consulting service by an agency with a particular expertise in quality seed programs. In such cases, the seed may

be labeled with a specially developed quality assurance tag which indicates the kind of services performed.

(86)