



OSU-OARDC Plant Germplasm Release Guidelines and Practices



April 2001
Special Circular 178
Ohio Agricultural Research and Development Center



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OSU-OARDC

Plant Germplasm

Release Guidelines and Practices

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Contents

OSU-OARDC Plant Germplasm Release Guidelines and Practices	5
Introduction	5
The Nature and Scope of the Ohio Seed Industry	5
Varieties and Germplasm Released — 1990 to 2000	6
Mechanisms for Germplasm Release	6
Crop Variety Release and Distribution Committee	6
CVRDC Functions	9
Membership	10
General Provisions	10
Guidelines for Release	11
Grain Crops	11
Seed Propagated Vegetable and Ornamental Crops	12
Speciality Varieties	12
Non-Exclusive Contractual Release	13
Exclusive Contractual Release	13
Other Releases of OSU-OARDC Germplasm	13
Assignment of Rights to Discarded Germplasm to Breeders	14
Guidelines for Granting Exclusive Rights to Market OSU-OARDC Crop Varieties Nationally and Internationally	14
Mechanisms for Distribution, Production, and Certification of Seed and Clonally Produced Germplasm	15
Official Seed Certification Agency for Ohio: Ohio Seed Improvement Association	15
Considerations for Seed-Propagated Vegetable and Ornamental Germplasm	16
Clonally Produced Germplasm	16
Ohio Foundation Seeds	17
Agricultural Genetics Research Association	17
Policy for Royalty Distribution Associated with Licensed Plant Varieties	17
Evaluation Criteria for Proposed Releases	18
Appendices	21
Appendix 1: OARDC Mission Statement	23
Appendix 2: Ohio Revised Code, Section 907.02	24
Appendix 3: OSU Plant Variety Protection Disclosure Form	25
Definition of Terms	27

Tables

Table 1. OSU-OARDC Variety and Germplasm Releases Since 1990.	7
Table 2. Recommended Trait Data for Release.	19

OSU-OARDC Plant Germplasm Release Guidelines and Practices

Introduction

Ohio crop production acreage traditionally ranges from 9.5 to 10 million acres annually. In addition, approximately 1.5 million acres are used for hay and pasture production. Ohio's major agronomic crops are corn, wheat, and soybeans.

In 1999, Ohio produced corn on 3.2 million acres with a total production of 403 million bushels (4 percent of the U.S. total production). Soybeans were produced on 4.5 million acres with a total production of 162 million bushels (6 percent of the U.S. total production). Ohio produced soft red winter wheat on 1.02 million acres (4 percent of the U.S. total soft red winter wheat production) and oats on 100,000 acres (4.8 percent of the U.S. total oats production).

Other crops grown in Ohio (1999) include rye (4,000 acres), tobacco (9,800 acres), sugar beets (1,700 acres), processing tomatoes (6,700 acres), potatoes (4,700 acres), and miscellaneous fruits and vegetables (27,700 acres).

The Nature and Scope of the Ohio Seed Industry

The seed industry in Ohio is characterized by the production and marketing of major and minor crop species. Ohio-grown and Ohio-conditioned seed is valued at \$40 million a year, while the total value of seed used for crop production in Ohio approaches \$120 million per year (excluding turfgrass seed). In general, the Ohio seed industry can best be described as quite diverse and comprised of both privately owned and corporate firms.

The Ohio farmers' annual requirement for seed of major agronomic crops is met by both the importation of (out-of-state) seed and domestic (Ohio) production. Domestic seed-corn production in Ohio is estimated to supply 1 percent of the seed needs for the state. It is estimated that 15 percent of the 4.5 million acres of Ohio soybeans are planted using domestically produced and certified soybean seed. Approximately 40

All policies and guidelines contained in this document were approved by unanimous vote of the Crop Variety Release and Distribution Committee (CVRDC) on February 23, 2001. With this approval, this Special Circular 178 supersedes all previously enacted policies and guidelines of the CVRDC.

percent of Ohio's 1.1 million acres of wheat are planted to certified seed and branded seed.

Other miscellaneous seed produced in Ohio includes small grain seed crops, such as barley, spelt, and rye, and legumes, such as red clover.

Ohio farmers' need for forage, grass, and specialty-crop seed species is largely met by importing seedstock from other states. These minor crops include grasses, forage legumes, and vegetables. Information regarding turf-type seed species usage is unavailable. However, urban consumer and industrial demand is estimated to exceed \$6 million annually for these high-value seed types.

Nursery and greenhouse production of ornamental plants is the fastest growing segment of U.S. agriculture. Together, these constitute Ohio's third largest plant commodity behind corn and soybeans. On a nationwide basis, Ohio ranks fifth in wholesale production of ornamental plants.

Varieties and Germplasm Released — 1990 to 2000

During the decade of the 1990s, The Ohio State University's Ohio Agricultural Research and Development Center (OSU-OARDC) and cooperative U.S. Department of Agriculture-Agricultural Research Service (USDA-ARS) breeding programs have released 77 new varieties and germplasm lines (see Table 1). Of these 77, 52 have been public or cooperative USDA-ARS releases. Releases have included one birch, 11 maize synthetic populations, four maize inbreds, and five oat, one pear, six soft red winter wheat, 34 soybean, one spelt, four strawberry, and 10 processing tomato cultivars.

Mechanisms for Germplasm Release

Crop Variety Release and Distribution Committee

Release of all new crop varieties or germplasm from OSU-OARDC is coordinated by the Crop Variety Release and Distribution Committee (CVRDC). Once a proposed variety is deemed suitable for release, it must be approved by the Director of OARDC. Breeder seed is provided to various public, private, or nonprofit organizations for maintenance, distribution, or further improvement. Ultimately, certified seed producers multiply the seed for sale to the end users, the growers.

The purpose and mission of the CVRDC is to advise the Director of OARDC on matters pertaining to the development, release, and distribution of the best-quality germplasm of agronomic crops or other plant materials to Ohio farmers and the public.

Implicit in this objective is the philosophy that the best lines will be released as public varieties except in those cases where, upon the considered judgment of this committee, the release of a particular line or variety through proprietary agents would best serve the interests of Ohio farmers. In such cases where release of varieties or lines through a proprietary agent is recommended, a public release of such germplasm shall always be considered first. Branded and exclusive releases shall be considered as secondary alternatives.

New public varieties of soybean, wheat, and oat are released to members of the Ohio Seed Improvement Association (OSIA). New branded varieties of soybean, wheat, and oat may be released to the Agricultural Genetics

Text continues on page 9

Table 1. OSU-OARDC Variety and Germplasm Releases Since 1990.

Birch

2000	OH7999NW01	Exclusive/Public Release
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Maize Inbreds

1993	OH599	Public Release
	OH603	Germplasm
1999	OH1VI	Germplasm (USDA-ARS)
2000	OH605	Germplasm

Maize Synthetic Populations

1991	OHS3(C5)	Germplasm
	OHS11(C1)	Germplasm
	OHS12(C1)	Germplasm
1993	OHS9(C1)	Germplasm
	OHS10(C1)	Germplasm
1994	OHS11V(C1)	Germplasm
1995	OHS3267(C11)	Germplasm
	OHS3267LAN(C5)	Germplasm
	OHSCB-TF(C1)	Germplasm
2000	CashRS(C12)	Public Release/Germplasm
	Mod. Cash Synth.(C1)	Public Release/Germplasm

Oat

1991	Armor	Public Release
1995	Chairman	Public Release
	Burton	Public Release
1997	OH1086	Public Release
1998	Keystone	Public Release

Pear

1993	Potomac	Cooperative Release (USDA-ARS)
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Continued

Table 1 (continued). OSU-OARDC Variety and Germplasm Releases Since 1990.

Soft Red Winter Wheat

1991	Excel	Public Release
	GR915	Branded Release
1992	Freedom	Public Release
1994	Glory	Public Release
1995	Hopewell	Public Release
	GR962	Branded Release

Soybean

1991	Erie	Public Release
	HM-1	Germplasm
1992	Charleston	Public Release (USDA-ARS)
	HM-2	Germplasm
	HM-3	Germplasm
	HM-4	Germplasm
1992	Thorne	Public Release
1993	Sandusky	Public Release
	Vertex	Public Release
	HC83-195	Germplasm (USDA-ARS)
1994	Ohio FG1	Public Release
	Ohio FG2	Public Release
	Stressland	Public Release (USDA-ARS)
1995	Croton 3.9	Public Release (USDA-ARS)
	General	Public Release
	HS90-3515	Branded Release
	HS90-3516	Branded Release
	HS90-3518	Branded Release
1996	Defiance	Public Release
	Flint	Public Release
1997	HS10C2	Germplasm
1998	Tiffin	Public Release
	HS93-4118	Branded Release
	Darby	Public Release
	HF83-035	Branded Release
	HF83-083	Branded Release
	Troll	Public Release (USDA-ARS)
	HC95-24MB	Germplasm (USDA-ARS)
	HC95-15MB	Germplasm (USDA-ARS)
1999	Kottman	Public Release
	Stout	Public Release (USDA-ARS)
	Strong	Public Release (USDA-ARS)
2000	HS95-4907	Branded Release
	HS95-4908	Branded Release

Table 1 (continued). OSU-OARDC Variety and Germplasm Releases Since 1990.

Spelt	1990	GR900	Branded Release
Strawberry	1994	Northeaster	Cooperative Release (USDA-ARS)
		Delmarvel	Cooperative Release (USDA-ARS)
		Primetime	Cooperative Release (USDA-ARS)
		Latestar	Cooperative Release (USDA-ARS)
Tomato	1991	Ohio 8245	Public Release
	1992	Ohio 7983	Public Release
	1993	Ohio 8556	Public Release
	1995	Ohio OX38	Public Release
		Ohio OX88	Exclusive Release
		Ohio OX42	Exclusive Release
	1999	Ohio 9242	Public Release
		OX52	Public Release
		OX150	Public Release
	2000	OX23	Branded Release
		LA407	Inbred BC Population

Research Association (AGRA), which will market them to interested companies.

Other new varieties or germplasm developed through exclusive and non-exclusive contractual agreements will be released according to policies established by the OSU Office for Technology Licensing (OTL) in consultation with the primary breeder.

I. CVRDC Functions

1. To determine what constitutes adequate evaluation of a breeding line or genetic material for release and to develop guidelines and criteria (see Section IV on page 13) for releasing varieties.

2. To recommend to the Director of the OARDC any variety, inbred line, or genetic materials for release. The Director's approval is required for all Ohio releases.

3. To assist, upon the recommendation of the committee to release a variety or germplasm, the appropriate plant breeder in preparation of an appropriate "variety release notice" for approval by the Director. The approved notice is to be sent to all state Agricultural Experiment Station directors, appropriate USDA personnel, interested private companies, and Ohio Department of Agriculture personnel.

4. To recommend to the Director of OARDC how new varieties or germplasm are to be released and distributed.

5. To make recommendations to the Director of the Ohio Department of Agriculture and to the Director of OARDC concerning changes needed in, or observed violation of, the Ohio Seed Law, including provisions of the Revised Plant Variety Protection Act of 1974.

6. To make recommendations to the Director of the Ohio Department of Agriculture and to the Director of OARDC concerning any matters deemed significant in terms of variety release and distribution involving agricultural crops.

7. To determine whether Ohio will participate and co-release cultivars or germplasm from other states. If royalty issues on out-of-state varieties are involved, the committee makes policy recommendations to the Director of OARDC.

II. Membership

1. Regular faculty and staff identified by the Chair of the Department of Horticulture and Crop Science as having responsibility for plant breeding research on corn, soybeans, small grains, tomatoes, and other agronomic and horticultural crops as deemed appropriate.

2. An OSU Extension agronomist/horticulturist involved in crop improvement and crop production.

3. Chair, Ohio State University Department of Horticulture and Crop Science, and Associate Chair, OSU Department of Horticulture and Crop Science.

4. Two representatives, from the OSU Department of Plant Pathology, responsible for corn, soybeans, small grains, or vegetables.

5. Representative from the OSU Department of Entomology.

6. Representative from the Ohio Seed Improvement Association (OSIA).

7. Representative from Ohio Foundation Seeds (OFS).

8. Representative from the Ohio Agribusiness Association.

9. Representative from the Ohio Department of Agriculture.

10. Assistant Director, Agricultural Industry, OSU Extension.

11. USDA-ARS crop breeders and geneticists stationed at Ohio State University.

12. Representative from the OSU Office for Technology Licensing.

III. General Provisions

The Chair of the Department of Horticulture and Crop Science shall serve as chair of the CVRDC; the Associate Chair of the Department of Horticulture and Crop Science shall serve as vice chair. A plant breeder in the Department of Horticulture and Crop Science shall serve as secretary of this committee. The committee shall be empowered to call upon the service of other individuals (on

an ad hoc basis) for advice and assistance in accordance with committee determination as to need for such advice and assistance.

All meetings of the committee must have a quorum of at least 10 members to conduct official committee business. Majority rule shall be recognized in all decisions of the committee. Committee governance shall be in accordance with *Robert's Rules of Order*. All votes shall be by ballot except where voice votes are agreed to unanimously by the voting members present. The breeder(s) involved in a variety or line release and members with direct proprietary interests in the proposed variety release shall abstain from voting on such releases.

The foregoing committee shall become one of the "continuing standing committees" of the College of Food, Agricultural, and Environmental Sciences, The Ohio State University, the Ohio Agricultural Research and Development Center, and Ohio State University Extension. Prior to July 1 each year, suggestions for changes in committee membership shall be made by those administrative officers to whom members of the committee regularly report. If no recommendations for change are received prior to July 1 of each year, the OARDC Director will reappoint all members for the succeeding committee year, which will commence on September 1 each year.

It is essential that the committee chair or vice chair establish regular meeting dates each year covering the period September 1 through the following August 31 and make known those dates to all members of the committee. Special meetings may be authorized by majority vote of the Executive Committee of the CVRDC which is comprised of the chair, vice chair, secretary, the representative of the OSIA, and the representative of the Ohio Department of Agriculture, or upon

petition by a majority of the total committee membership.

Each committee member shall consult with his or her supervisor or other appropriate official as to an individual who can be named as an official substitute and such substitute member shall attend all "specially called" meetings which cannot be attended by the regularly appointed member. Substitute membership will enjoy voting privileges at all such meetings. Minutes of each regular or special meeting shall be sent to each member of the committee, as well as to the Director of the Ohio Department of Agriculture and to the Director and Associate Director of OARDC. The Director of OARDC reviews and must approve all CVRDC meeting minutes.

Guidelines for Release

The intention of the release policy is to ensure a supply of high-quality germplasm (seed or clonally produced) to Ohio germplasm producers, commodity growers, and processors through a system of peer evaluation, certification, identity and purity verification, and improved end-use traits in OSU-OARDC germplasm. Plant Variety Protection (PVP) may be sought for public (non-exclusive) releases. Requests for exclusive releases are evaluated on a case-by-case basis.

I. Grain Crops

1. Public varieties of small grains and soybeans will be released and distributed to seed producers in Ohio and other states through Ohio Foundation Seeds (OFS). Seed producers may market OSU lines as a certified variety under the variety name or as a brand with the variety name not stated. Ownership of varieties remains with OSU-OARDC.

2. OSU-OARDC lines may be covered by the Plant Variety Protection Act, Title V. Seed sold as a public variety must be certified, and branded seed may carry a green tag of quality assurance. Certified seed and green tags will have the following (or similar) statement on the label:

"IT IS PROHIBITED TO USE OR SELL GRAIN, PRODUCED FROM THIS SEED, AS SEED."

3. Seed will be sold in foundation, registered, and certified seed classes. Seed producers will be required to sign a licensing agreement prior to seed sale from OFS. This restriction also applies to foundation seed sales outside Ohio.

4. A royalty will be assessed on all foundation and certified seed sold. OSIA will serve as the agency for royalty collection. The royalty rate will be set by the OSU Office of Technology Licensing (OSU-OTL) for each crop variety release. Partitioning of collected royalties between OSU-OTL and OSIA will be negotiated annually with an effective date of July 1 through June 30 of each year. Royalties retained by OSIA will be sufficient to cover all reasonable administration and collection costs and all promotional activities of OSU certified varieties.

5. Seed distribution by foundation or certification agencies outside of Ohio will be as a class of certified seed only. Seed producers in other states may market Ohio lines as private brands through a licensing agreement with OFS. Distribution of royalties collected on out-of-state sales of registered and certified seed is as follows: 40% of the royalties remain with the collecting state, and 60% will be forwarded to OSIA. In cases where seed is distributed directly to growers in other states by contract with OFS, all royalties will be returned to OSIA. Partitioning of

out-of-state collected royalties will be covered by an annual agreement between OSIA and OSU. For branded varieties or varieties released exclusively through the Agricultural Genetic Research Association (AGRA), 60% of the royalties collected will be allocated to OSU and 40% to AGRA.

6. Sister lines or other lines not released to OSIA may be offered to AGRA with the right of first refusal as per existing agreement.

7. OARDC may make released varieties available to other breeders for any research purposes permitted by the Plant Variety Protection Act. Recipients of such seed must sign a suitable Materials Transfer Agreement (MTA).

II. Seed Propagated Vegetable and Ornamental Crops

Open-pollinated varieties will be offered on a non-exclusive basis. Exclusive licenses for hybrid varieties will be provided on a case-by-case basis for domestic and international markets. Requests for Proposals for exclusive licenses will be announced periodically upon approval for release of individual hybrids. Guidelines for exclusive license proposals and criteria for evaluating such proposals are addressed under a separate heading of this document (see page 14). All licenses will include a license issue fee and a royalty on sales.

III. Specialty Varieties

Specialty varieties are varieties that may require a special effort by the producer or the processor in order to exploit their unique characteristics. Release of these varieties is governed by the same principles described for other varieties, and there are no special practices associated with specialty varieties. Public release will be considered first, but

release as branded varieties, including exclusive release to a single producer or a group of producers, is an option. Because additional time may be needed to identify a potential licensee and to test the product, OSU-OARDC researchers may provide samples of seed or other products to interested parties prior to release, under an MTA. Royalties on the value-added products themselves (beyond the seed, per se) may be considered, particularly in cases where seed sales will be minimal.

IV. Non-Exclusive Contractual Release

New cultivar germplasm not deemed suitable for public release and not accepted by AGRA may be offered to OSIA members on a non-exclusive, contract basis. This option is most likely to occur when germplasm does not have wide agronomic adaptability in the state or has other characteristics that might limit variety acceptance.

V. Exclusive Contractual Release

Exclusive licenses to certain germplasm may be entered into with companies in a number of situations. Those situations include (1) a company plans to sell in a certain international marketplace, (2) a variety is developed under contract with a third party, or (3) a variety is classified as a specialty variety and may require a special effort by the licensee to exploit the unique characteristics.

In all of the previous situations, the following apply: (1) the source of foundation seed will be OFS; (2) the production of registered seed will be in Ohio; licensee may also contract for the production of certified seed with U.S. growers and, preferably, Ohio growers; and (3) licensee will agree that any contracting with producers will include a buy-back of all production whether seed meets certifi-

cation standards or not, and licensee will ensure that any seed not meeting those standards will not be sold as seed but will be disposed of through commercial channels so that the identity is lost. Licenses will be negotiated through the OSU-OTL.

VI. Other Releases of OSU-OARDC Germplasm

The factors listed here will be considered when determining other releases of germplasm.

1. Protection of OSU-OARDC germplasm.
2. Protection of intellectual property and research opportunities.
3. Role of a public institution to ensure equitable distribution of germplasm to stakeholders.

After the decision has been made to release other germplasm, the guidelines listed here are enacted.

1. Elite germplasm must be released through the CVRDC irrespective of the recipient or the use. (This would include lines to be used as varieties directly.)
2. Germplasm with/or novel traits and genes should be released through the CVRDC and should only be made available with the appropriate MTA.
3. Lines to be used as parents of hybrids must be released with an MTA, but it is not necessary for all potential parents to be released through the CVRDC if the breeder has determined that the line does not fit (1) or (2) stated previously.

Raw germplasm for use in crossing or raw segregating populations to be used for derivation of lines could be released without

CVRDC approval. Such a release should not require an MTA. If the population or raw germplasm contains identifiable novel traits or genes or commercial value, it is in the breeder's best interest to release these varieties or populations as "germplasm" under (2) stated previously.

VII. Assignment of Rights to Discarded Germplasm to Breeders

The University's *Policy on Patents and Copyrights* allows for the dedication of the University's rights in an item to the public. The breeder's discarding of inferior or excess germplasm may put the seed in the public domain but is clearly not a dedication by the University of its rights in the lines to the public. On the other hand, the University's *Policy* has a requirement to permit the former breeder to request and be granted rights to such germplasm. Thus, the former breeder should make a formal request for discarded germplasm to the Director of OARDC who is obligated to honor reasonable requests. The OARDC reserves the right to charge a fee to recover costs of staff time and materials needed to fill such requests.

Any release of elite germplasm or finished lines to former OARDC breeders, staff, or students may occur only if the current OARDC breeder, chair of the CVRDC, and the Director of OARDC determine that it is of no further value to the OARDC program. Populations or raw germplasm, initiated by the former breeder, should be made available to the former breeder without restriction to protect the breeder's intellectual property and research opportunities.

When a decision to assign rights to discarded lines, germplasm, or populations has been reached, the guidelines listed under Section VI shall be enacted.

When the current breeder has evaluated germplasm left in the program by a former breeder, the current breeder has partial ownership rights in the germplasm and therefore has a voice in determining the appropriate disposition of such material that is discontinued. The current breeder may, for reasons of convenience, discard the material that is clearly of no value without offering it to the former breeder.

Guidelines for Granting Exclusive Rights to Market OSU-OARDC Crop Varieties Nationally and Internationally

The Plant Variety Protection Act gives the owner of a crop variety the right to restrict export of seed. Interested companies, marketing groups, or individuals who wish to market OSU-OARDC varieties in a particular market should prepare a proposal and submit it to the CVRDC. After reviewing the proposal, the CVRDC will make a recommendation to the Director of OARDC and to the OSU-OTL regarding its acceptance.

The proposal should outline a plan for seed production, seed certification, marketing, and collection of research fees and/or royalties. The proposal should indicate that the requesting organization or individual has done sufficient preparation to give a high probability of success in the proposed market. Proposals should indicate:

1. A brief description of commodity production practices and prevailing seed sales practices in the target market.
2. Compliance with all applicable state and national laws, including those of the foreign country where marketing may take place.
3. A detailed plan for marketing, including the distribution of variety descriptions or other promotional material.

4. The financial compensation that will be paid to Ohio State University.
5. A mechanism to protect OSU-OARDC's rights as owner of the variety.
6. A mechanism to assure preservation of genetic identity and integrity of OSU-OARDC varieties.
7. A detailed description of arrangements made for seed production.
8. A detailed description of seed certification standards that will be followed.

The OSU-OTL has the ultimate authority and responsibility to negotiate and complete any licensing agreement.

In its review, the CVRDC will use the following guidelines:

1. The impact of the proposed activity to Ohio agriculture will be considered carefully. Only proposals that are consistent with the mission of OSU-OARDC (see Appendix 1) will receive favorable action.
2. The proposal should contain a marketing plan, financial arrangements, and seed certification guidelines that maximize the variety's opportunity for successful use.
3. Any assistance in developing the variety that was provided by the organization or individual making the request will be considered by the CVRDC in its recommendation. Assistance will be ranked according to the following criteria:
 - a. Direct funding through a grant;
 - b. Assistance with replicated trials at multiple locations, including the collection of quantitative data;
 - c. Assistance with replicated trials at multiple locations, including the collection of qualitative or subjective data;
 - d. Assistance with unreplicated or single-location trials.

c. Assistance with replicated trials at multiple locations, including the collection of qualitative or subjective data;

d. Assistance with unreplicated or single-location trials.

4. Maximization of royalties to OSU-OARDC will not be the only factor regarding assignment of release privileges. A priority ranking for an exclusive variety release privilege or option will be awarded as follows:

- a. Ohio producers;
- b. U.S. producers outside Ohio;
- c. International firms.

5. Assignment of exclusivity to Ohio-based firms may result in assignment of distributor rights to foreign firms as subcontractors.

6. The Ohio State University reserves the right to award exclusivity on a case-by-case basis such that the interests of all petitioning parties and the originator can be fairly served.

Mechanisms for Distribution, Production, and Certification of Seed and Clonally Produced Germplasm

Official Seed Certification Agency for Ohio: Ohio Seed Improvement Association

Section 907.02 of the Ohio Revised Code (see Appendix 2) designates the OSIA as the official seed-certifying agency for Ohio. The association shall certify agricultural or vegetable seed, tubers for seeding purposes, or plants for varietal identification or for other factors. The OSIA is ultimately responsible to the Director of the Ohio Department

of Agriculture. This association maintains and makes available to the farmers of Ohio and other states, and the public in general, high-quality seed of genetically pure varieties.

The OSIA is a nonprofit organization, which is supported by fees and levies paid by the membership. OSIA is governed by a Board of Directors consisting of eight producer members, three university representatives, and one representative from the Ohio Department of Agriculture.

The OSIA office is located at Dublin, Ohio. A modern seed laboratory provides seed analysis services for both members and farmers. More than 18,000 such tests are performed annually. Seed crops certified in Ohio include corn, soybeans, wheat, barley, oats, spelt, forestry reproductive materials, and native grasses. Total acres entered for field inspection have historically exceeded 100,000 annually.

The Ohio seed certification program is based on genetic purity standards. OSIA also provides quality control inspection services for non-certified seed crops and identity preserved (IP) grain produced by members.

Considerations for Seed-Propagated Vegetable and Ornamental Germplasm

OSIA may be responsible for certification of vegetable and ornamental seed produced and sold in Ohio. Testing of seed produced and marketed could be accomplished by other organizations. Because the standard assay for detection of important seed-borne bacterial diseases is only 50% effective at a threshold of one infected seed per 10,000 seeds tested, all licensees should include the seed quality-control process [described here] beginning at the second year of commercial production.

1. Breeders seed for the male and the female parent will be used for a foundation seed increase in an environment that is not conducive to seed-borne diseases.
2. Foundation seed increases will be inspected and rogued for purity.
3. Foundation seed for male and female parents will be certified as disease-free.
4. Hybrid seed production will be contracted for areas with low incidence of bacterial disease. Certified foundation seed will facilitate this step.
5. Hybrid seed production will be inspected and a pathology report issued.
6. Hybrid seed production will be split between at least two different growing regions as a precaution against crop failure.
7. Seed will be tested. Contaminated or impure seed will be rejected.
8. In order to maintain seed supply and to ensure that high-quality seed is produced and distributed, OSU-OARDC recommends a 24-month inventory.

Clonally Produced Germplasm

For clonally produced germplasm, there is an optional Certification program administered in Ohio by OSIA. Licensees should contact OSIA directly for information regarding this program. Alternately, maintenance of genetic identity and purity is the responsibility of the specific nurseries that accomplish post-release distribution and production through cooperative agreements with OSU-OARDC (i.e., the nurseries would agree to propagate and sell OSU-OARDC products for an established fee).

In addition, certification may involve screening for viruses, other diseases, or characters

specific to a particular clonally produced crop. The nurseries are also responsible for ensuring that the specific tests are conducted and that the germplasm meets appropriate standards. More than one nursery may participate in propagation and marketing of clonally produced germplasm. Agreements with participating nurseries are negotiated by the OSU-OTL.

Ohio Foundation Seeds

There is no state agency per se in Ohio responsible for distributing seed to farmers, breeders, growers, and others. Seed of a new variety of grain crop is released by the University plant breeder to Ohio Foundation Seeds, Inc. (OFS). OFS is a not-for-profit company responsible to OSU-OARDC, under a memorandum of understanding, for producing foundation seed and breeder seed.

Breeder seed grown by OFS is inspected and approved by the breeder for use in production of foundation generation seed. Subsequent generations (i.e., registered and certified class) are grown by seed producers who are members of the OSIA. Purity and quality standards are certified and enforced by OSIA. OFS is also responsible for producing and maintaining foundation seed of varieties released for branding or exclusively to one company. Seed of new public varieties developed by OSU-OARDC may be shared with foundation-seed-producing companies in other states under guidelines published by the directors of state agricultural experiment stations.

Agricultural Genetics Research Association

The Agricultural Genetics Research Association (AGRA) was established in 1985. The 1998 agreement between AGRA and OSU-

OARDC states that grain crop varieties not recommended for public release by the CVRDC shall be considered for possible release to AGRA on a first-refusal basis, and AGRA shall have exclusive rights to reproduce and merchandise those varieties accepted. AGRA must accept or reject a variety within 60 days after the variety is offered. A royalty, which is negotiated on each variety, is to be paid to OSU for each unit of seed sold. All varieties are to be maintained by OFS.

Policy for Royalty Distribution Associated with Licensed Plant Varieties

At the request of what then was the Department of Agronomy, the Faculty Committee on Patents and Copyrights recommended, and the OSU Vice President for Research approved, on November 26, 1991, a variation from *The Ohio State University Patents and Copyrights Policy* for agronomy seed-breeder royalty distribution. Due to departmental and college restructuring and other concerns, it is necessary to restate and clarify the Policy Variation. This *Revised Policy Variation* supersedes the previous Policy Variation and affects all royalties received by the OSU-OTL after the date of this *Revised Policy Variation*.

The OSU-OTL shall continue to distribute royalties in the following manner:

For all seeds for which Plant Variety Protection or plant patent protection has been obtained and for branded varieties, cultivars, genetic stocks, and germplasm for which Plant Variety Protection has not been obtained: fifteen percent (15%) to the project leader (defined later) according to the distribution scheme reported in the *OSU Plant Variety Protection Disclosure Form* (see Appendix 3) and eighty-five percent (85%) to

the research program within the department of the College of Food, Agricultural, and Environmental Sciences that generated the royalties. Any unreimbursed expenses associated with filing for Plant Variety Protection or plant patent protection will be recovered by OSU-OTL from royalties prior to distribution.

This Policy applies to varieties, cultivars, genetic stocks, parental lines, and germplasm, and the project leader of record, regardless of the department or college in which the project leader resides. The Policy *does not* apply to inventions covered under pending or issued patents.

The term "project leader" shall mean the OSU employee designated as the first listed investigator on the CSREES project of the program from which the variety is derived at the time of release. Distribution of the 15 percent share will be determined by that project leader listed on the *OSU Plant Variety Protection Disclosure Form*. Each project leader shall have discretion to determine whether and to what extent the 15 percent share shall be allocated among those who contributed to development of the seed. Only those who made an inventive or intellectual contribution during the breeding process, which ultimately resulted in the final variety, shall be eligible for an allocation of the 15 percent share.

Evaluation Criteria for Proposed Releases

As stated previously, the CVRDC shall evaluate all proposed releases. The CVRDC will use the criteria stated here in its deliberation.

1. Minimum standards for testing in Ohio:

a. Varieties developed by backcrossing four or more generations to an existing variety...one year and three tests (site-years).

b. Varieties developed by backcrossing two or three generations to an existing variety...two years and six tests.

c. All other varieties...three years and nine tests.

Exception: The testing requirement may be waived by the CVRDC in cases where the superior performance of the proposed release in one or more characteristics is judged to outweigh the limitation in numbers of test environments.

2. For the guidance of CVRDC members in interpreting the data, Least Significant Differences (LSDs) should be presented for quantitative traits that are subject to substantial nongenetic variation (yield, maturity, heading date, height, etc.). It is usually inconvenient to perform the combined analysis of variance necessary to obtain exact LSDs for traits measured in multiple tests; therefore, it is acceptable to substitute separate LSDs for each test or year of testing or to calculate an approximate LSD for multi-year tests. The approximate LSD may be obtained from combined analyses of data sets that are believed to be typical of Ohio test data. The 10, 20, or 30 percent significance level may be more appropriate than 5 percent for decisions concerning variety release. The LSD should be used by the committee as a guideline for estimating the genetic superiority of a potential new release; it is not intended to set a rigid requirement that new releases must exceed established varieties by the LSD or another fixed amount.

3. Pedigree information will be supplied.

4. Any variants will be described and their frequency will be reported.

5. Presentations of crop-specific data on the traits listed in Table 2 are strongly recommended. See Table 2 on the following page.

Table 2. Recommended Trait Data for Release.

Corn	Small Grains	Soybeans	Tomatoes	Forestry Reproductive Materials
Yield	Yield	Yield	Yield	Growth rate
Maturity or % moisture	Heading date	Maturity by date	Color/color uniformity	Trait benefit
Lodging	Lodging	Lodging	Firmness	Adaptation
Height	Height	Height	Soluble solids	Site index
Ear height	Baking & milling quality	Seed size	pH	Aesthetic value
Test weight/density	Test weight	Protein	Titrateable acids	Wood characteristics
Disease resistance	Disease resistance	Oil content	Pigment content	
Insect resistance	Insect resistance	Disease resistance	Maturity	
		Insect resistance	Disease resistance	
			Insect resistance	
			Fruit size	
			Harvestability	

Data on other traits should be presented according to the breeder's judgment. Not all traits apply in each case.

Table 2 (continued). Recommended Trait Data for Release.

Small Fruit Crops	Tree Fruit and Nut Crops	Ornamentals
Clonal propagation requirements	Clonal propagation requirements	Growth habit
Growth habit (plant form)	Rootstock interstem recommendations	Growth rate
Adaptation (environmental stress tolerance)	Growth habit (tree form)	Size (height, canopy diameter) at maturity
Chilling requirements	Adaptation (environmental stress tolerance)	Summer/fall leaf color
Flowering habit	Precocity	Flower color persistence
Fruit development, quality characteristics, and ripening patterns	Chilling requirements	Flowering habit
Yield	Flowering habit	Flowering period
Nutritional/nutriceutical value	Flowering period	Fruit color and persistence
Mechanical harvestability	Fruit development, quality characteristics, and ripening patterns	Bark characteristics
Shelf-life and storage behavior	Yield	Stress tolerance
Consumer acceptance	Nutritional/nutriceutical value	Disease resistance
Disease resistance	Mechanical harvestability	Insect resistance
Insect resistance	Consumer acceptance	Vertebrate resistance
	Disease resistance	Propagation requirements
	Insect resistance	

Data on other traits should be presented according to the breeder's judgment. Not all traits apply in each case.

Appendices

Appendix 1: OARDC Mission Statement

Mission of the Ohio Agricultural Research and Development Center

The mission of the Ohio Agricultural Research and Development Center is to enhance the well-being of the people of Ohio, the nation, and the world through research on foods, agriculture, family, and the environment.

Vision of the Ohio Agricultural Research and Development Center

The OARDC shall be a premier institution sought by:

- Ohioans as the primary source of unbiased research on food, agriculture, family, and the environment.
- Domestic and international students and scholars for advanced education in food, agricultural, family, and environmental research.

The OARDC shall be a premier institution committed to:

- Safe, healthy, and affordable food and agricultural products.
- Sustainable food and agricultural systems.
- Strong rural and urban communities.
- Stewardship of natural resources and the environment.
- Keeping Ohio positioned favorably in a global economy.

The OARDC shall be a premier institution recognized for:

- National and international leadership in discovering new knowledge, solving problems, and in partnership with OSU Extension, developing and transferring technology.
- Interdisciplinary research and outreach teams that, with OSU Extension, form partnerships with stakeholders throughout Ohio, the nation, and the world.
- Focused research programs in selected areas of excellence on the Wooster and Columbus campuses, branches, and other sites throughout Ohio.

Appendix 2: Ohio Revised Code, Section 907.02

General Assembly: 121.
Bill Number: Amended Sub. House Bill 117
Effective Date: 09/29/95

- (A) The Ohio Seed Improvement Association shall certify for Ohio, agricultural or vegetable seed, tubers for seeding purposes, or plants for varietal identification or for other factors.
- (B) No person shall use, orally or in writing, alone or with other words, "certified," "registered," "foundation," or any other term which suggests that the seed, tubers for seeding purposes, or plants have been certified unless the seed, tubers for seeding purposes, or plants have been certified by the Ohio Seed Improvement Association.
- (C) The following information shall appear on the certification label attached to each container of each lot of seed, tubers for seeding purposes, or plants sold as "certified," "registered," or "foundation":
- (1) The grower's name and address or producer number;
 - (2) The name of the Ohio Seed Improvement Association as the certifying agency;
 - (3) The origin of the seed, tubers for seeding purposes, or plants;
 - (4) Any other information the director of agriculture may require by rule concerning health, vigor, purity, type, and other matters pertaining to certification.

Appendix 3: OSU Plant Variety Protection Disclosure Form.



Plant Variety Disclosure Form

A. Proposed Variety Name and Number _____

B. Genus and Species Name _____

C. Kind Name _____

D. Project Leader — Name/position/department number/phone.

E. Royalty Distribution (Include OSU Personnel and Percentages):

1. _____
2. _____
3. _____
4. _____

F. Date of Determination _____

B. Application for PVP Certificate Attached? Yes _____ No _____

H. Potential Licensees of This Variety _____

I. Submitted By _____ Date _____

FORWARD TO: Office for Technology Licensing, Research Foundation Building, 1960 Kenny Road, CAMPUS (292-2550) with a copy to Department Chairperson or Unit Head

DATE RECEIVED _____ ACKNOWLEDGEMENT _____

Guidelines for PVP Disclosure Form

The Plant Variety Protection Act provides patent-like protection for sexually (i.e., seed) reproduced plants, other than fungi or bacteria, and to tuber reproduced crops. The variety must be distinct from all other varieties, uniform, and stable as defined in Section 41a of the Plant Variety Protection Act. If the variety has been sold or used in the United States for more than one year or in a foreign country for longer than four years, the variety is ineligible for protection. (Use of the variety to produce and market a first-generation hybrid is considered use of the variety). In addition to the OSU PVP Disclosure Form, a complete Plant Variety Protection Application form must be submitted to USDA's Plant Variety Protection Office.

- A. Please give the proposed name and number of the variety.
- B. Genus and species of variety is self-explanatory.
- C. The term "kind" means one or more related species, or subspecies, singly or collectively known by one common name, such as soybean, wheat, flax, etc.
- D. The term "project leader" means the OSU employee designated as the first listed investigator on the CSREES project of the program from which the variety is derived at the time of release.
- E. If the project leader designated in D wishes to distribute the royalties received from sales of this variety amongst a group of participants based on their contribution to the final product, the individuals and their percent sharing should be designated here. If this section is left blank, royalties will only be distributed to the project leader listed in D.
- F. The date that the project leader determined that he/she had a new variety based on: (1) the definition of new variety as defined in the PVP Act, (2) the date a decision was made to increase the seed, and (3) the date that the Crop Variety Release Committee (or project leader) votes to release a variety.
- G. If a PVP Application has been filled out, please attach to this form. If one has not yet been filled out, please note when an Application will be filed.
- H. What companies are likely to license this variety?
- I. Please sign and date.

Definition of Terms

Backcrossing — Mating of a hybrid to one of its parents. BC₁, BC₂, etc. Symbols used to designate the first backcross generation, the second backcross generation, and so forth.

Branded Seed — Plant material derived from a cross that is sold without a variety name. The variety is owned by a seed genetics supplier which licenses the production and marketing rights to one or more other companies to be marketed under many different brand names. Branded seed must be labeled under variety-not-stated provisions of applicable state seed labeling laws.

Breeder Seed — Seed or vegetative propagating material, increased by the originating, sponsoring plant breeder or institution, used as the source for the increase of foundation seed.

Certified Seed — (a) Seed of a cultivar that has been verified for its genetic identity and purity by an official seed-certifying agency. Classes of certified seed are foundation, registered, and certified. (b) Class of certified seed that generally is produced from a planting of registered seed, but which also may be produced from foundation or certified seed.

Cultivar — Synonymous with variety; the international equivalent of variety.

Elite Germplasm — Plant materials of proven genetic superiority. Material in this advanced stage of development is a candidate for variety release.

Exotic Germplasm — Plant material of unknown genetic value often comprised of plant introductions, accessions, or germplasm of diverse geographic origin. (See also *Raw Germplasm*.)

Foundation Seed — Seed stocks increased from breeder seed, and so handled as to closely maintain the genetic identity and purity of a variety. Foundation seed is the source of certified seed, either directly or through registered seed.

Germplasm — Total of the genotypes that constitute a species.

Hybrid — Seed or plants produced as the result of controlled pollination as opposed to seed produced as the result of natural pollination.

Material Transfer Agreement (MTA) — A document developed by the originator or plant breeder setting forth terms of restricted use of plant materials, populations, varieties, elite and raw germplasm, brands, and other plant propagules.

Open Pollinated — Seed produced as the result of natural pollination as opposed to hybrid seed produced as a result of controlled pollination.

Public Release — Variety or germplasm developed and released by public institutions, such as universities, colleges, institutes, centers, USDA-ARS.

Private Release — Variety or germplasm developed and released by a private company.

Plant Variety Protection (PVP) — The developer of a new distinct variety may obtain protection for a variety if he/she chooses to do so, provided the variety meets the requirements of the Plant Variety Protection Act of 1970. This Act permits the owner or developer of a variety to prohibit others from selling, sexually multiplying, using for propagation for seed, or using to produce a hybrid, seed of his variety. The Act was revised in 1994.

Two options for plant variety protection are available to the developer of the variety. Under the first option, the developer of the variety or his/her agent may sell either certified or uncertified seed of the variety. If the developer of the variety has reason to believe that anyone is infringing on his/her rights, he/she may resort to civil court action.

The other option (“certification option”) for protecting a variety utilizes the provisions of the Title V of the Federal Seed Act. A variety protected in this manner may be sold by variety name only as a class of certified seed.

It is the responsibility of the seller to inform the buyer if the variety is protected. Each container of seed sold should be labeled with a tag indicating the type of protection that the owner has. Under the first PVP option the label will state: “Unauthorized Propagation Prohibited — U.S. Protected Variety.”

If the owner of the variety has chosen the other option for variety protection, the label will state, “Unauthorized Propagation Prohibited — To Be Sold by Variety Name Only as a Class of Certified Seed — U.S. Protected Variety.”

Raw Germplasm — Genetic material that has been derived from plants or native populations or parental material of unproven genetic status. Much selection pressure must be applied to such materials in order to derive superior performing varieties. Specifically defined as $F_{4'}$, $S_{3'}$, or earlier; coefficient of inbreeding equivalent to that of $F_{4'}$, $S_{3'}$, or lower.

Registered Seed — Class of certified seed generally produced from foundation seed, but which may also be produced from breeder seed.

Variety — Subdivision of a species for taxonomic classification. Used interchangeably with the term cultivar to denote a group of individuals that are distinct genetically from other groups of individuals in the species. An agricultural variety is a group of similar plants that by structural features and performance can be identified from other varieties within the same species.

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