

Recommendations from the Plant Licensing Task Force

A report to the
Minnesota State Legislature

and the

University of Minnesota
Board of Regents

Delivered January 2007

Executive Summary

The 2006 Minnesota Legislature requested that the University of Minnesota establish a Plant Licensing Task Force to study the University's policies and procedures for developing and licensing plant germplasm and varieties and to make recommendations to the legislature and the Board of Regents no later than January 15, 2007. The task force was chaired by Beverly R. Durgan, Director of the Minnesota Agricultural Experiment Station and Dean – University of Minnesota Extension and included representatives of the Minnesota Department of Agriculture, the University of Minnesota and Minnesota's agricultural, agronomic and horticultural crop organizations. The recommendations contained in this report were endorsed by the active participants in the task force.

Task Force Focus

The legislation establishing the task force had its origin in concerns about the University exclusively licensing a new apple variety "MN 1914" to Pepin Heights Orchard, Inc. During the final days of the 2006 legislative session, a law was passed and signed by the governor establishing the task force and requesting the University refrain from implementing the MN 1914 apple license. After conversations with the chairs of the legislative committees that passed the bill and the governor's office, it was determined that by agreeing to amend the license, the University and Pepin Heights have taken appropriate measures to resolve any issues with the license.

The task force decided that since the specific issues around the MN 1914 apple licensing were resolved, the task force would focus on the broader issues around University of Minnesota plant licensing. We recognize that the plant licensing concern is best understood within the context of broader issues. For many years, plant research at the University of Minnesota has been enormously important to Minnesota producers. In the past few years the agricultural community has expressed growing concern about the decrease in funding for this type of research program. The task force also recognizes that royalties on publicly developed materials are now the norm for most publicly funded institutions around the world, but that royalties do not provide adequate funding for needed research.

This task force encourages a public policy discussion between the Minnesota Legislature, the University of Minnesota Board of Regents and Minnesota's agricultural, agronomic and horticultural crop organizations to encourage adequate public funding for plant related research and outreach.

Plant Licensing Task Force Process

An eighteen-member task force was formed in June 2006 and met three times between June 2006 and November 2006. The diversity of Minnesota's plant production was well represented by task force members whose interests ranged from strawberries to wheat, from soybeans to apples, from landscaping plants to corn. Members had strong expertise in the production and marketing of agricultural and horticultural crops. The task force members heard presentations on plant licensing policies and future trends, reviewed documents outlining current procedures and discussed ways to improve the process. The

meetings were well attended and recommendations were developed at the first two meetings and discussed further at the third meeting. In addition, the task force met via conference call the first week in December to review a draft of the report.

Plant and Germplasm Licensing Overview

The University of Minnesota plant breeding programs focus on three goals:

- Discovering new knowledge about plant breeding and plant genetics
- Educating graduate and undergraduate students
- Developing plant germplasm, genetic stocks and varieties

The 800-plus plant varieties developed by the University range from specialty soybeans to cold-hardy apples. These plant varieties generate economic activity, provide new options for growers, add color to Minnesota landscapes and help supply consumer demand for landscaping plants and fruits that thrive in Minnesota's climate. Royalties from licensed varieties generate about \$1.5 million a year for the University. This revenue, though significant, does not cover the cost of the University plant breeding programs. Furthermore, the revenue is expected to decline in 2008 when the patent for the "Honeycrisp" apple expires.

Recommendations of the Plant Licensing Task Force

The task force was in general agreement that the University of Minnesota has the appropriate policies and procedures in place to develop and license plant germplasm and varieties as either exclusive or non exclusive varieties, but is making the following recommendations to the Minnesota Agricultural Experiment Station for improving the process.

1. Communication: The task force recommends that the University revise its variety and germplasm release procedures in order to improve communication with the agricultural community. The challenge is to balance the need for confidentiality to protect potential patents with the desire for more specific information on varieties under development.

Specifically, the University should revise the Minnesota Agricultural Experiment Station's Crop Variety and Horticulture Variety Review Committee procedures to include the following steps when decisions are made during the plant and germplasm development and licensing process.

- **Review Committees:** The Crop Variety Review Committee and the Horticultural Variety Review Committee evaluate potential plant varieties and germplasm. The University should invite a grower group representative when either of these committees discusses topics of interest to that grower group. The grower group representative will be required to sign a confidentiality agreement to protect intellectual property and possible patents.
- **MAES Director Recommendations:** When the Minnesota Agricultural Experiment Station Director makes a recommendation on the release of a new variety, that information will be shared with grower groups interested in that variety.
- **Invention Disclosure:** When a University of Minnesota researcher develops or discovers a new plant germplasm or related plant breeding material that may be worthy of a release, the researcher files an Invention Disclosure Form with the University of Minnesota Office of Patents Technology and Marketing (PTM). This process is confidential to protect the intellectual property and possible patent. The University should at this point share the invention disclosure information with groups who provided funding for the project.

In addition to these specific steps, the University should increase its efforts to provide information about the breeding programs through websites, interaction at grower meetings and by taking advantage of other communication opportunities.

2. Exclusive release considerations: The task force recommends the University continue to monitor its operating procedures regarding exclusive plant variety releases to assure that the interests of the agricultural public are considered. The task force also recommends that the University revise the Minnesota Agricultural Experiment Station

variety and germplasm release procedures to emphasize that when appropriate the university should provide:

- Access to Minnesota direct market growers (growers who sell directly to end consumers) and wholesale producers (growers who sell to restaurants, grocery stores, garden centers, etc.).
- Preference to Minnesota based companies; and
- Preference to licensees willing to work with Minnesota growers.

3. Funding challenges: The task force recommends the University, Minnesota growers and the Minnesota State Legislature work together to assure that the plant breeding programs are prepared to face future financial challenges.

- Funding is critical and methods need to be developed to assure sufficient funding to support research and educational programs especially in this era where state and federal funding is declining.
- The current process should be re-examined and a process developed for making choices about plant breeding program priorities because of limited funding for improving current crops and the potential to develop new crops and breeding plants for novel traits such as biofuels, nutraceuticals and ecosystem services.
- Plant breeding program priorities should include: return on investment; economic development; environmental considerations; impact on graduate and undergraduate education; and importance to Minnesota consumers and producers.

University Reaction to Plant Licensing Task Force Recommendations

The plant breeding faculty that represented the University of Minnesota on the Plant Licensing Task Force expressed support of the task force recommendations and plans to work with growers, University leadership and legislators to implement these recommendations. The Minnesota Agricultural Experiment Station is taking steps to revise its variety and germplasm release procedures to reflect the recommendations of the task force. The University has also scheduled a meeting with plant license task force participants to review progress and receive additional stakeholder input. That meeting is currently scheduled for 10 a.m. to 2 p.m. on Wednesday, Nov.7, 2007.

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- MAES/COAFES Policy and Procedures Statement-Distribution and Release of Plant Germplasm and Related Plant Materials.
- Release Procedures for Horticultural Cultivars and Germplasm from the Minnesota Agricultural Experiment Station
- Minnesota Agricultural Experiment Station Procedures for Release and Recommendation of Field Crop Varieties in Minnesota

Introduction and Background

The 2006 Minnesota Legislature requested that the University of Minnesota establish a Plant Licensing Task Force to study the policies and procedures of the University of Minnesota for developing and licensing germplasm. This task force was requested to make recommendations to the legislature and the Board of Regents no later than January 15, 2007.

The Task Force was chaired by Beverly R. Durgan, Director of the Minnesota Agricultural Experiment Station and Dean – University of Minnesota Extension and included representatives of the:

- Minnesota Apple Growers Association
- Minnesota Association of Wheat Growers
- Minnesota Barley Growers Association
- Minnesota Corn Growers Association
- Minnesota Crop Improvement Association
- Minnesota Department of Agriculture
- Minnesota Farm Bureau Federation
- Minnesota Farmers Union
- Minnesota Fruit and Vegetable Growers Association
- Minnesota Nursery and Landscape Association
- Minnesota Soybean Growers Association
- Northern Minnesota Forage Turf Seed Advisory Committee
- University of Minnesota Crop Variety Review Committee
- University of Minnesota Office of Patents, Technology & Marketing
- University of Minnesota Plant Breeding Faculty
- University of Minnesota Agricultural Experiment Station

At its first meeting the group decided that organizations will select the person to represent them at each individual meeting. To accommodate schedules, some organizations had different individuals representing them at the meetings. In addition, for information purposes, some organizations had more than one member attend some meetings.

The membership chart on the following page shows the names of individuals who represented an organization at one or more meetings. In addition, there were four ex officio members representing the University of Minnesota.

Plant Licensing Task Force Members/Attendees

Chair - University of Minnesota Agricultural Experiment Station

Beverly Durgan, Dean and Director

Minnesota Apple Growers Association

John Jacobson

Rick Van Lin

Minnesota Association of Wheat Growers

Dave Torgerson, Executive Director

Minnesota Barley Growers Association

Marvin Zutz, Executive Director

Minnesota Corn Growers Association

Bruce Stockman, Executive Director

Minnesota Crop Improvement Association

Gary Beil, President/CEO

Minnesota Department of Agriculture

Paul Strandberg, Project Manager

Minnesota Department of Agriculture Marketing Division/ Minnesota Grown Program

Paul Hugunin - Agricultural Marketing Specialist

Minnesota Farm Bureau Federation

Willis Anthony

Minnesota Farmers Union

Thom Peterson, Director

Minnesota Fruit and Vegetable Growers Association

Marilyn Nysetvold Johnson, Executive Director

Minnesota Nursery and Landscape Association

Bob Fitch, Executive Director

Minnesota Soybean Growers Association

Mike Youngerberg - Director of Field Services

Steve Commerford

Northern Minnesota Forge Turf Seed Advisory Committee

Richard Magnusson - Chair

University of Minnesota Crop Variety Review Committee & College of Food, Agricultural and Natural Resource Sciences

Nancy Ehlke, Chair, Crop Variety Review Committee and Professor

University of Minnesota Office of Patents, Technology & Marketing

Jeff Carpenter, Director

University of Minnesota Plant Breeders

Jim Orf, Professor

Jim Luby, Professor

Ex Officio Members- University of Minnesota

John Byrnes, Minnesota Agricultural Experiment Station

Sarah Greening, Minnesota Agricultural Experiment Station Deputy Director

Todd Iverson, University of Minnesota Government Relations

Abel Ponce de Leon, Associate Dean, College of Food, Agricultural and Natural Resource Sciences

Summary of Plant Licensing Task Force Activities

Brief summaries and highlights from Plant Licensing Task Force meetings are listed below.

Meeting # 1: July 7, 2006

At the first meeting the members shared their expectations for the task force, set overall goals for the task force and discussed plant licensing and germplasm development and licensing. Formal presentations reviewed and summarized the University of Minnesota plant breeding programs, Minnesota Agricultural Experiment Station variety release policies, the history of plant variety development programs and future developments nationally and internationally in variety development programs. The task force also determined self governing rules and topics to focus on in future meetings.

Meeting # 2: August 21, 2006

The second meeting provided updates on specific information that task force members had requested at the first meeting. This included: (1) statistics on the releases and royalties from the University of Minnesota horticultural and agricultural breeding programs; (2) case studies of a horticultural and an agronomic crop variety development and licensing process (MN 1914 apple and MN00261-4 Hard Red Spring Wheat); and (3) agricultural crop variety development and licensing processes in other states. The group discussed this information and identified key points to be included in the final task force report.

Meeting # 3: November 8, 2006

The third meeting focused on reviewing a draft final report and discussing changes that would strengthen that report.

Meeting # 4: December 5, 2006

A conference call was held and revisions made to the final report.

More detailed information

Meeting minutes, associated presentations and background information used by the task force can be found at www.maes.umn.edu/plantlicense

Summary of Plant Licensing Task Force Key Information

The Plant Licensing Task Force examined information concerning the development of plant germplasm and varieties at the University of Minnesota and the licensing of those varieties. This section summarizes key information from those documents and presentations. The complete set of documents and presentations can be found on the task force website at www.maes.umn.edu/plantlicense.

University of Minnesota Plant Breeding Activities

The University of Minnesota plant breeding program began more than one hundred years ago to breed plants adapted to Minnesota's climate. The current University of Minnesota plant breeding and genetic programs focus on three goals:

- Discovering new knowledge about plant breeding and plant genetics
- Educating graduate and undergraduate students
- Developing plant germplasm, genetic stocks and varieties

The first agronomic crop varieties released by the University of Minnesota were hard red spring wheat varieties released in the 1890s. Since that time the University has released more than 450 agronomic crop varieties. These varieties are selected for unique characteristics that include increased number of bushels harvested, resistance to pests, unique industrial and nutritional profiles, and appeal to end users. The focus of the program evolved as grower needs changed. Early soybean releases focused on adapting the crop to Minnesota, later releases focused on resistance to disease. The current program provides soybean varieties with traits that appeal to specialty and export markets. Current University of Minnesota plant breeding or germplasm release programs for agronomic crops includes:

- Soybean Breeding and Genetics
- Spring Wheat Breeding and Genetics
- Barley Breeding and Genetics
- Oat Breeding and Genetics
- Wild Rice Breeding and Genetics (USDA)
- Grass Breeding and Genetics
- Legume Breeding and Genetics
- Corn Genetics
- Alfalfa Genetics (USDA)

(An illustrated catalog of University of Minnesota releases of major and minor crops, and the research that went into their development was shared with the task force. That catalog can be found at www.maes.umn.edu/FoodforLife)

When early settlers arrived in Minnesota they carried with them plants from the East. Many of these plants suffered severe winter injuries and early frosts when planted in Minnesota. The University of Minnesota horticultural plant breeding program began as a drive to discover plants that would survive Minnesota winters. Since its origin in the 1880s the University's horticulture program has named and released more than 100

varieties of fruits, more than 100 flowering plants and more than 60 vegetable varieties. Apple breeding has been a focus of the program starting with the Haralson apple in 1922 and continuing through the release of Honeycrisp in 1991 and Zestar in 1998. Current University of Minnesota horticultural plant breeding and germplasm release programs include:

- Small Fruit Breeding and Genetics
- Flowers (mums)
- Apple Breeding and Genetics
- Ornamental Woody Plants
- Grape Breeding and Genetics
- Potato Breeding and Genetics.

(An illustrated catalog of University of Minnesota releases of horticultural plants from 100 years of research was shared with the task force. This catalog can be found at www.maes.umn.edu/MNHardy)

University of Minnesota Procedures for Licensing Plants and Germplasm

The current process is that when a University of Minnesota researcher develops or discovers a new plant germplasm or related plant breeding material that may be worthy of a release, the researcher files an Invention Disclosure Form with the University of Minnesota Office of Patents Technology and Marketing (PTM). Their mission is the proprietary transfer of U of M technology for commercial use in the public good consistent with the University's mission. Filing the Invention Disclosure Form begins an internal process with PTM, Minnesota Agricultural Experiment Station (MAES) and College of Food, Agricultural and Natural Resource Sciences (CFANS) to evaluate a possible release. This process is confidential to protect the intellectual property and possible patent.

The Crop Variety Review Committee evaluates potential agronomic or field crop variety releases. The Horticultural Variety Review Committee evaluates potential horticultural plant germplasm. Both committees are appointed by the MAES director and charged with recommending which varieties should be released, the variety names of releases and the type of release (public release or a non-public release via an exclusive or a non exclusive license agreement). The recommendations are made to the MAES Director and the MAES Director forwards that recommendation to PTM. Decisions are variety specific and reflect the unique traits of a new variety. The current process is summarized in the table that follows.

- Step 1:** U of M Researcher decides plant or genetic material has unique properties that may merit a license or patent.
- Step 2:** Researcher files an Invention Disclosure Form with U of M Patents and Technology and Marketing (PTM).
- Step 3:** Review committees meet and make recommendation to the MAES Director about licensing the discovery (no license, exclusive license, non

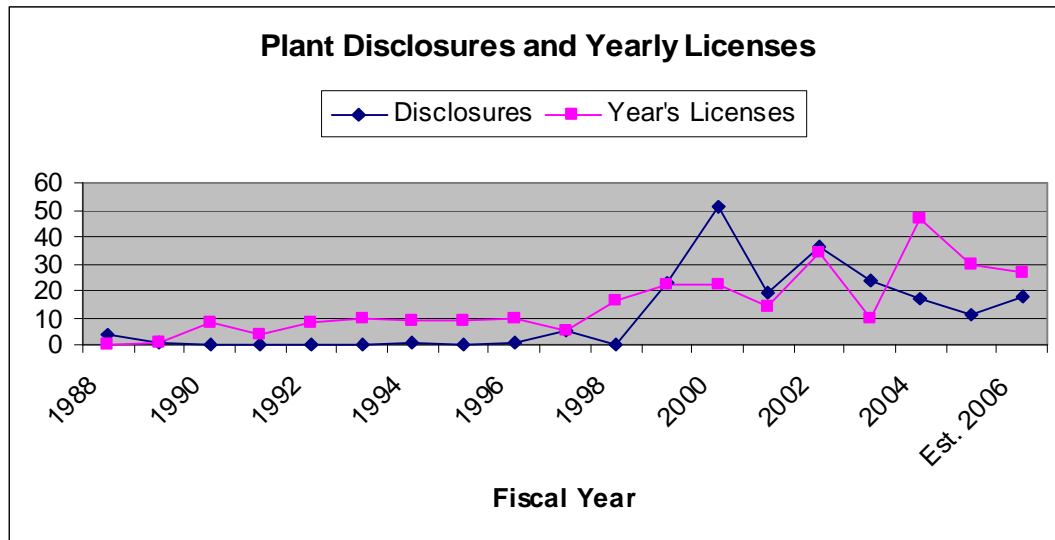
exclusive, etc.).

Step 4: MAES Director after consultation makes recommendation to U of M PTM about licensing.

Step 5: PTM makes arrangements for license.

The number of varieties approved to be licensed varies from year to year. The University estimates that it will license about 18 varieties in 2006 with all but one of these varieties being a horticultural variety. The total number estimated in 2005 was 30 varieties with half of those being horticultural varieties.

U of M policies and procedures for licensing plants and germplasm were shared with the task force. These can be found in the appendix to this report and also at www.maes.umn.edu/plantlicense.



Trends in licensing plants and germplasm

The trend that began in the early 1900's was for varieties to be developed exclusively for commodity growing systems. The agronomic varieties were primarily distributed through publicly available releases through the certified seed programs overseen by the Minnesota Crop Improvement Association, an independent, not for profit, organization housed on the St. Paul campus. The horticultural varieties were distributed to individual growers with those growers paying a fee or royalty.

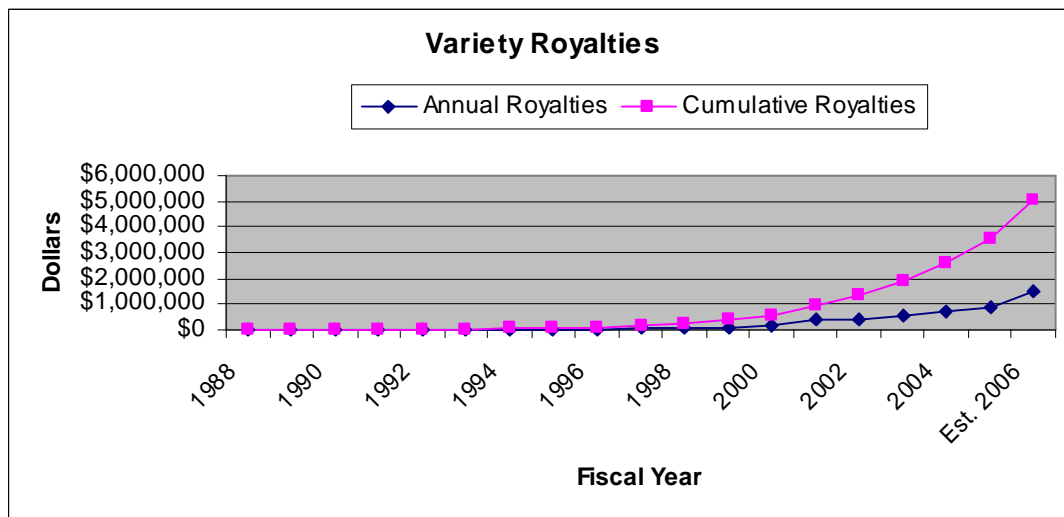
The trend nationally and in Minnesota is toward exclusive releases. Non-exclusive, generally released varieties often do not fit well in newer markets because of the demand for traceability, the role of variety marketing, specific variety traits and intellectual

property protection factors. In addition, a non-exclusive release may still be building market share when the patent and thus the royalties for the release expire. The Honeycrisp apple patent expires in 2008 and University of Minnesota royalties on planting Honeycrisp trees will cease at the same time market demand for the variety is accelerating.

Financial revenue from University of Minnesota licenses of plants and germplasm

Royalties from plant and germplasm licensing will generate an estimated \$1.48 million for the University of Minnesota in 2006. Horticultural royalties account for \$1.26 million of this amount. University royalties from Honeycrisp will end in 2008 when the Honeycrisp patent expires. University task force members expressed concern about the combination of this expected decline in royalties and challenges with state and federal funding.

The cost of the University of Minnesota breeding program exceeds the revenues generated by plant and germplasm royalties. The University estimated that its total out-of-the-pocket cost since the MN 1914 apple was “discovered and developed” in 1999 was \$2.2 million. Similarly, the cost of the wheat breeding program since the “discovery and development” of the MN00261-4 Hard Red Spring Wheat variety was \$3.1 million. With shortfalls in public funding, University administrators look to revenues from plant licensing to help cover these costs.



Next Steps on Plant Licensing Task Force Recommendations

The plant breeding faculty that represented the University of Minnesota on the Plant Licensing Task Force expressed support of the task force recommendations and plans to work with growers, University leadership and legislators to implement these

recommendations. The Minnesota Agricultural Experiment Station is taking steps to revise its variety and germplasm release procedures to reflect the recommendations of the task force. The University has also scheduled a meeting with plant license task force participants to review progress and receive additional stakeholder input. That meeting is currently scheduled for 10 a.m. to 2 p.m. on Wednesday, Nov.7, 2007.