



Plant Variety Protection

Certified seed assures growers of genetically pure, high-quality seed

by Lance Nixon

Bob Pollmann, manager of the Seed Certification Service, with first-ever PVP granted to SDSU

In 1978, the South Dakota State University Agricultural Experiment Station applied for what is called “plant variety protection” from the federal government on a new variety of spring wheat named ‘Eureka.’

The official certificate from an office of the USDA that arrived in early 1979 marked the first time that South Dakota State University had obtained plant variety protection (PVP) for one of its new releases. Since then, seeking plant variety protection has become a regular practice.

“We apply for plant variety protection because it gives the Agricultural Experiment Station protection from someone taking our variety, making some very minor variations, and then marketing it under another name,” says Jack Ingemansen, manager of Foundation Seed Stocks at South Dakota State University.

“One of the reasons plant variety protection was passed into law was so that developers of new varieties could get a return on their investment,” Ingemansen says, adding that it typically takes a plant breeder about 10 years or so to develop and release a new variety.

The Plant Variety Protection Act was approved by Congress in 1970 and amended several times, most recently in 1994. The act provides intellectual property rights to developers of new varieties of plants that reproduce by seed or tubers. The law does not cover bacteria and fungi.

The USDA Plant Variety Protection Office grants a “Certificate of Protection” that gives the successful applicant

exclusive rights to multiply and market that variety of seed for 20 years for most crops or 25 years for trees, shrubs, and vines.

As part of the application process, the applicant has to prove that the variety is distinct, uniform, and stable; disclose the pedigree, breeding methods, and selection criteria used in creating the new variety; and put down \$3,025.

The applicant may request that the new variety be entered under Title V of the plant variety protection code. That stipulates that the new variety be sold only as a class of certified seed. Farmers must purchase certified seed to obtain the new variety, says Ingemansen.

A general exemption to PVP guidelines allows public plant breeders to use the variety to develop other new varieties without violating PVP guidelines.

Another general exemption allows a producer who has purchased certified seed to save seed and replant the variety on his own holdings. A court ruling has added the interpretation that a producer can save and replant only the same amount of seed as was originally purchased. The law doesn’t allow the producer to save and sell non-certified seed from his production to others for seed.

PRODUCERS REAP BENEFITS in the long run because of these restrictions, says Ingemansen.

The South Dakota State University Foundation Seed Stocks Division and the South Dakota Crop Improvement Association are nonprofit public corporations that, along with commodity check-off groups, provide significant financial support to South Dakota State University plant breeders to develop new varieties.

In addition, Ingemansen says, studies have shown that buying certified seed gives producers genetically pure, high quality seed, with enough of a yield differential to pay for the additional cost.

“There are a number of studies done over the years that show certified seed has a yield advantage of 3 to 5 bushels over seed that hasn’t been professionally grown and conditioned,” adds Bob Pollmann, manager of the Seed Certification Service at South Dakota State University.

Pollmann and Ingemansen say the advent of biotechnology adds new complexity to issues of plant variety protection, especially in cases where a company holds a patent on some particular trait. The glyphosate-tolerant gene from Monsanto, which South Dakota State University already is using in soybeans under an agreement with the company, is a good example.

Monsanto owns the patent on the gene, and patent law forbids growers and others from saving seed and replanting

it. But South Dakota State University also routinely seeks plant variety protection on those Roundup Ready® soybean varieties released from South Dakota State University, because the variety in which the trait is packaged for South Dakota producers is South Dakota State University’s intellectual property.

“It’s a partnership,” Pollmann explains. “Monsanto owns the patent on the gene and the South Dakota Agricultural Experiment Station owns the germplasm or variety the trait was inserted into. They can’t release our varieties without our permission any more than we can release a variety with their patented trait without their approval.”

Land-grant universities and private companies will likely pursue similar working relationships by which both sides benefit as biotech traits are readied for the marketplace, Pollmann says.

Both Ingemansen and Pollmann say it’s entirely possible that South Dakota State University in the future could seek patents. Utility patents are most commonly sought for plant traits and require the applicant to reveal in great detail exactly how a plant or plant trait was derived, including the exact genome a trait is found on.

But applying for plant variety protection, not patents, will probably continue to be the standard way South Dakota State University protects intellectual property and helps pay for its ongoing plant breeding work in varietal development, Pollmann says.◆

PVP timeline: plants and intellectual property rights

1793: Thomas Jefferson pens U.S. patent law. It allows patents on “any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement thereof.” Plants are not mentioned, and there is no inkling, for well over a century to come, that plants could be intellectual property.

1924: A handful of American farmers begin paying \$1 a pound for a “hybrid” seed corn called Copper Cross. Though there is no law forbidding them to save and plant their seed, the nature of hybrids makes it unprofitable to do so. Implicit is the recognition that the company developing the particular hybrid has created something new and different that farmers will pay a premium to obtain—a first step toward recognizing plant genetics as intellectual property.

1930: The Plant Patent Act of 1930 protects “distinct” and “new” asexually reproduced varieties, or those reproduced by cutting, layering, budding, or grafting. The U.S. Patent and Trademark Office has oversight.

1970: The Plant Variety Protection Act protects varieties that are sexually reproduced by seed or are tuber-propagated. A special office of USDA oversees the law.

1980: A U.S. Supreme Court ruling in *Diamond v. Chakrabarty* finds that “anything under the sun that is made by man” is patentable, including a bacterium produced by science that has “markedly different characteristics from any found in nature and one having the potential for significant utility.

His discovery is not nature’s handiwork, but his own; accordingly it is patentable ...” The ruling broadens patent law to include living organisms.

1994: The Plant Variety Protection Act is amended to stipulate that farmers cannot sell seed they have saved from a PVP variety to others for reproductive purposes. The law allows a farmer to replant a quantity of seed that is equal to the initial purchase quantity of the protected variety.

1995: A court case, *Asgrow Seed Company v. Winterboer*, finds it a violation of the PVP Act to sell saved seed for reproductive purposes.

1996: Monsanto Company’s patented Roundup Ready® technology is made commercially available in soybeans. The soybeans carry a gene that enables them to withstand the herbicide Roundup.® Growers who buy the seed violate U.S. patent laws if they save and grow subsequent generations of the seed. Instead they must buy new seed from licensed dealers.

2000: A first-of-its-kind agreement between South Dakota State University and biotech company Monsanto highlights the increasing complexity of protecting intellectual property in plants. The agreement allows South Dakota State University to use Monsanto’s Roundup Ready® gene in soybeans developed specifically for South Dakota. Monsanto owns the patent on the gene. But SDSU also seeks plant variety protection to protect its intellectual property—the variety into which the gene is inserted. Continuing work on transgenic spring wheat at South Dakota State University and other land-grant universities suggests there will be other such working agreements in the future.