Should we consider General Public License for bean germplasm?

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Plant breeders still regularly exchange germplasm, but will this cooperative attitude increasingly suffer from proprietary pressures within both the private and public sectors? Recently, Price reported, based on results from his survey of US public sector plant breeders, “that public sector plant breeding has been negatively impacted by the private sector's development and control of proprietary genetic stocks. Nearly 50% of public plant breeders have had difficulties obtaining genetic stocks from companies; the most shocking result is that almost 1/4 of the breeders responded that graduate student training has been harmed.” While Price’s survey focused on flow of germplasm from private companies to public institutions, corporate models and intellectual property protection mechanisms implemented at public institutions signal that obtaining germplasm from those sources may become similarly difficult in the future.

Over the past 20 years, intellectual property protection applied to plant germplasm in the form of plant breeder’s rights and plant variety protection conserved the right of others to use the bona fide samples of the protected germplasm in subsequent breeding programs. Recently however, breeders and their institutions have employed at least three methods to restrict others from using released cultivars in their breeding program.

The first of these methods is the Material Transfer Agreement (MTA) which accompanies movement of innovative products like transgenes, vectors or unique germplasm. MTAs specify terms under which those products can be used as well as the disposition of resulting cultivars. According to Price (1999), the MTAs are the primary barrier to movement of germplasm between public and private sectors.

The second of these methods is the Technology Use Agreement (TUA). In the plant germplasm context, TUAs govern the disposal of genetically modified crop cultivars produced by farmers. The TUA signed by Ontario growers of 1999 crop year Roundup Ready™ Soybeans from Novartis Seeds stipulated that “The grower agrees not to use this seed or provide it to anyone for crop breeding, research or seed production.” Clearly, other soybean breeders did not have free access to these beans for use in their own research programs.

The third method is the utility patenting of seed-reproduced plants in the USA. A search of the U.S. Patent and Trademark Office database returns hits for many patents on cultivars, mostly corn and soybeans. The wording of a typical claim associated with utility patents on crop cultivars apparently prohibits crossing with the patented cultivar. Of particular interest to common bean breeders is U.S. Patent 5,894,079 awarded 13 April 1999 to Phaseolus vulgaris cv. ‘Enola’. The claims include crossing with ‘Enola’, and a claim to “A field bean variety of Phaseolus vulgaris that produces seed having a seed coat that is yellow in color”. Utility patents on seed-reproducing plants not only limit use of these cultivars in breeding programs, but might limit the usefulness of unrelated germplasm that duplicates a claimed characteristic.
I do not mean to argue here that MTAs, TUAs or U.S. Patents are entirely inappropriate or unfair. They serve to protect investment in innovations such as vectors and transgenes. What does strike me as inappropriate and unfair, however, is that the base genotype into which the innovation is inserted, a base genotype which at its origins likely came from a public source, is locked away from further iterative improvement by the breeding community. These protection mechanisms accost the spirit of cooperation among breeders. If we look forward 20 years from now, the consequence of a flourishing proprietary climate might be a deteriorating germplasm pool for public and private sector breeders alike. Without germplasm, breeding programs run out of fuel.

It is my contention that a means must be found to counter this proprietary mind set and develop and maintain an ample pool of germplasm that can be freely accessed by coming generations of plant breeders. My proposal to this end is the General Public License for Plant Germplasm (GPLPG).

The two fundamental tenets of GPLPG are that 1) plant germplasm designated as GPL is freely available for use in any breeding program, and 2) any cultivar a breeder develops that has GPL plant germplasm in the pedigree must also be designated as GPLPG. The mechanics of germplasm exchange includes the development of an MTA that would accompany GPL plant germplasm transferred from one breeder to another alerting the recipient that 1) the germplasm has been designated as GPLPG and that 2) by using this germplasm in a crossing program the recipient acknowledges that any cultivars derived in whole or in part from GPL plant germplasm must likewise be designated GPLPG and made available to other breeding programs. You may initially designate as GPLPG any germplasm for which you are the breeder and for which there are no obligations that cannot be satisfied simultaneously under the terms and conditions of the General Public License. You must place a sample of your GPL plant germplasm in a public sector plant germplasm bank to which other breeders have access. GPLPG does not preclude a breeder from charging a royalty for reproduction of the cultivar itself, or obtaining plant variety protection. It does, however, curb beneficiaries from modifying GPL plant germplasm and attempting to restrict its further use in other breeding programs.

An instrument such as GPLPG will only be implemented if the breeding community senses value, contributes to its development and helps generate broader awareness and support. Given such a task, what are the next steps?

- please think through what the plant germplasm access situation will be 20 years from now
- review the GPLPG proposal and share with me your comments and suggestions for its improvement
- inform your colleagues and students of the proposal and invite their comments
- advise your national plant germplasm resources officials of the proposal

3) Michaels, T. E. 1999. General Public License for Plant Germplasm. URL=