Editorial

Symbionts—Private and Public Plant Breeders

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Plant pathologists in cooperation with plant breeders, or plant pathologists in the role of plant breeders, have for many years been intimately involved with the science (and art) of plant breeding, most commonly for the purpose of disease control through the development of resistant plant cultivars. The success record of U.S. scientists for this research is an outstanding achievement of which we can all be proud. Over 10 years ago it was estimated that more than 75% of the crop acreage in the United States was being planted with disease-resistant cultivars, with an annual value to growers of over a billion dollars.

For the first 60 years of this century, crop improvement through plant breeding was primarily accomplished by researchers employed by the USDA or by state agricultural experiment stations, ie, public plant breeders. Private plant breeders, those employed by commercial enterprises, also made important advances but their numbers were fewer and they researched fewer crop species than public plant breeders. Plant pathologists were not very common in the private sector. Perhaps vegetable breeders and those researching ornamentals were more common than field or forage crop breeders within the private sector during those years. More recently, the activity of private companies has greatly increased in the field crops area, and a number of companies now employ plant pathologists to play key roles in the development of disease-resistant cultivars.

Private plant breeders have for many years welcomed new, improved plant releases by public breeders because often these new cultivars, or breeding lines, have been characterized by unique and important gene combinations. These genes may then be incorporated into new cultivars by the private plant breeders. One of the widespread uses of public releases by private breeders involved dent and/or sweet corn inbreds. This practice some years ago may well have been one reason hybrid corn became a huge success so rapidly. At present, private breeders primarily use their own improved versions of these public inbreds.

Private plant breeders often make substantial contributions to the research efforts of public plant breeders. They supply seed samples of accepted commercial cultivars to public breeders for comparative studies or for use in plant breeding efforts. These seeds are mostly provided at no charge. Private breeders also test, in their trial grounds, several plant breeding lines for public researchers. Such tests may be for adaptability, type, yield potential, or disease and/or insect resistance. Private breeders also arrange for critical seed increases of important breeding lines being readied for release by public plant breeders. Again, this service may be rendered without charge. Helpful testing techniques or breeding procedures may also be reported by private plant breeders. Too often these valuable contributions by private to public plant breeders are not properly acknowledged. I take this opportunity, on behalf of myself and many others, to gratefully express this acknowledgment.

Private industry aids public plant breeders in other ways. It occasionally has sought financial support for public plant breeders through approaches to appropriate legislatures. When successful, this support has been and is very, very helpful. At present, private industry more commonly provides support via research grants, which are sometimes critical to the successful completion of significant new plant breeding researches by public scientists.

The role of the public plant breeder is changing. The number of private plant breeders has increased tremendously during the last 20 years, and virtually all plant species are now being researched by these competent scientists. They are very successful. Thus, there is less pressure from growers for public breeders to release new cultivars. The need for new germ plasm and breeding techniques continues, however, and more and more public plant breeders are concentrating on developing and releasing breeding lines with important new genes for plant improvement. An example would be the first breeding line to be resistant to an important disease. It is released as a breeding line because: 1) it lacks a few characteristics needed for commercial acceptability and may not be perfected for several years and 2) the genes governing disease resistance are urgently needed by all breeders of the particular plant, especially private breeders. The public plant breeder makes an important contribution by discovering disease resistance, initiating its incorporation into a reasonable looking crop plant, releasing the new germ plasm, and reporting the techniques needed for successful disease testing of breeding progenies. Most private plant breeders appreciate the release of such a breeding line.

An important role now being played by public plant pathologists and plant breeders is the training of young men and women for key positions in the private sector. Although the number of young plant breeders being trained appears adequate, only a limited number of plant pathologists are receiving the practical training applicable to a conventional, privately supported plant breeding program. With the present emphasis on laboratory plant pathology and genetic engineering, we may be neglecting breeding for disease resistance—an important part of our science that has served this nation so well for so long and is the ideal method of biological control of plant diseases.