

HORTICULTURE—INVENTION

The Plant Breeder Becomes an Inventor

By DR. JOSEPH ROSSMAN

CONGRESS has passed unanimously a law which gives the man who produces new plants the same encouragement and protection that the inventor of new mechanical or electrical apparatus has received for more than a century.

New plants can now be patented. For seventeen years the breeder of a new plant will have a monopoly on its production. He can grow and sell all of the new variety himself or allow others to raise and sell the new plants while he collects royalties, just as is customary with holders of patents on new radio devices or improvements to steam engines.

There is something new under the sun. As far as it is known this is the world's first plant patent law. Some other countries have a system of plant registration, but it does not confer full privileges of patent like the new law.

Now that plant breeders are assured a fair share of the profits of their creations, they will doubtless become more eager to produce new varieties, and more men will take up this work. Greater activity in this field will certainly result in more beautiful flowers, tastier and more lasting fruit, and plants of all kinds that will not fall before the onslaught of disease.

It is the plant breeder's work to create new and plentiful sources of food supply which can be easily and abundantly reproduced and to develop new medicinal plants to fight disease and lessen human suffering. The North needs a more hardy apple. Seedless fruits of all kinds are in great demand. A substitute for the rubber plant will make the United States free of importing this essential commodity from other countries, and make any plant breeder rich.

The white pine blister rust, the chestnut blight and the phoney peach disease cost the country millions every year. The plant breeder has a golden opportunity to develop new varieties which will stand up against these plagues.

But these changes will not come immediately. It will require many years for the combination of numbers of new plants and improvements in plants to take effect. To perfect just one new plant so that it can be put on the market often requires from 10 to 15 years. Luther Burbank, who while he lived sought the right to patent plants but died before his dream became a reality, devoted more than 19 years to perfecting his amaryllis and over 20 years to developing a new hybrid lily.

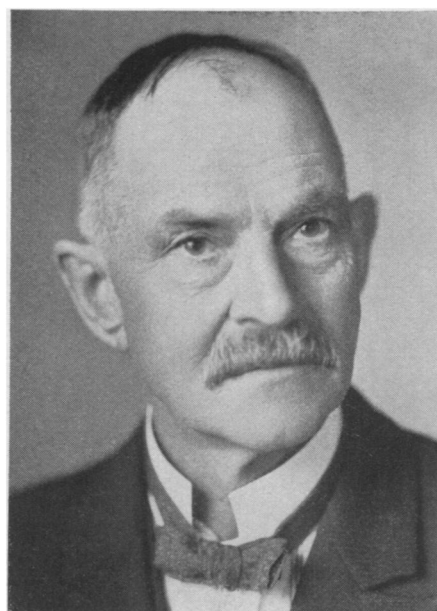
Already horticulturists have submitted applications covering plants which they claim are new and patentable, but the law is so young that full procedure for handling plant patents has not been worked out. The old legal rules and regulations that apply to chemical and mechanical patents will apply to plant patents.

Plants reproduced from seed and those propagated by tubers cannot be patented. Although this limitation applies to a large part of the plant breeder's field, it was made necessary by both commercial and technical reasons. For example, potatoes which are tuber-propagated and wheat which is raised from seed are both great food and seed crops. It is natural and usual for the farmer or gardener who buys potatoes for food to save a few and plant them in his garden. Should he do this with a patented variety and then sell some of his crop, he would be violating the patent.

Hard To Tell Apart

The technical reason is that it is very difficult to tell apart the different varieties of tuber and seed propagated plants. It was to make the law more workable, both for the grower and the consumer who must live under the law and for the scientists who must draw hairline distinctions, that these exclusions were specified.

The class of plants that can be patented, even though limited, offers horticulturists a wide field in which to work. It includes practically all new varieties of fruit and nut trees, such as



DR. WALTER VAN FLEET

The lack of a plant patent law such as the one which has recently gone into effect did not keep him from making twenty-four contributions to rose culture, one of which bears his name, and from introducing important new varieties of other flowers and vegetables.

apples, cherries, oranges, pecans and walnuts; and many small fruits like strawberries, raspberries and grapes; and ornamental shrubs and vines similar to lilacs, roses, wisteria and peonies.

These are plants which can be asexually reproduced. They can give origin to young plants without the sex action of pollination. The law gives the person who invents or discovers a new and distinct variety of plant the exclusive right to propagate that plant by asexual reproduction. It is possible to do this by grafting, cutting, budding, layering, division and like means; but not by seeds.

Even though others try to reproduce his new plant from its seeds, they will not be successful, for the offspring will immediately degenerate and become like the unimproved parent plants.

A plant breeder can develop a new plant in one of three ways. He may notice in a field of the same kind of plants that one plant, or perhaps just a part of it, has suddenly taken on a new appearance which makes it distinctly different from those around it. Such a sudden change is called a bud sport. To save this freak of nature before it is lost and to make it useful to mankind it must be propagated by grafting, budding, cutting, layering, division or a similar method. If it successfully

reproduces, a new plant has been born and the man who found it and nursed it along can have it patented.

If a new variety suddenly appears among seedlings, it too can be propagated asexually and patented. This new plant is called a mutant.

But most plants come from hybridization or the cross-pollination of different kinds of seedlings. The plant breeder artificially fertilizes one variety with the pollen from another to get a new plant. As in the first two cases, to preserve the character of the new individual, it must be reproduced asexually.

The successful hybrid thus obtained can be reproduced in no other way than by one of the asexual methods. If its seeds are planted, all the desirable qualities found in the parent will divide up among the offspring with the mathematical accuracy predicted in Mendel's laws. Most plant patents of the future will probably be granted in this field because the breeding of hybrids can be readily and scientifically controlled.

Thomas A. Edison, who after an exceptional life of mechanical inventing is now launching into the field of plant inventing" with his experiments with a goldenrod that will produce rubber, endorses plant patents. He says:

Edison's Endorsement

"Nothing that Congress could do to help farming would be of greater value and permanence than to give the plant breeder the same status as the mechanical and chemical inventors now have through the patent law. There are but few plant breeders. This will, I feel sure, give us many Burbanks."

To the name of Burbank, Edison might have added those of scores of other plant breeders, some of whom did work easily comparable with if not greater than that of Burbank. Among them, Dr. Walter Van-Fleet is outstanding. Dr. Van Fleet is best known for his 24 contributions to rose culture, one of which bears his name, but he also introduced important new varieties of peppers, sugar corn, tomatoes, gooseberries, strawberries, canna and gladioli.

Then there is Paul Stark, who had to protect his Delicious apple tree in an iron cage so that shoots for grafting would not be stolen. The famous Peter Henderson; E. G. Hill, the rose grower. Thomas Meehan, who brought out new varieties of grapes; and John Dreer, best known for his work with ornamentals; these are others to whom a successful plant patent law would have been an advantage.

Many difficult problems that are now unknown are expected to arise in the administration of the new law, as the case has been in the applications of the old laws governing mechanical inventions and chemical formulas. For one thing, it has always been possible to describe very exactly the parts and arrangement of a machine, or the ingredients and methods of compounding a formula. But no plant can be described in anything like that rigorous mechanical fashion.

And if the breeder says he got his new "invention" by hybridizing Species A with Species B, that does not mean that anybody else could get it by repeating the same process. He couldn't do it again himself, for hybrids never turn out exactly alike. All the hopeful patentee can do is to give as exact a description as he can write, make drawings, possibly supply samples, and let the horticulturists and the Commissioner of Patents decide.

In the language of the law, patents will be granted only to those who have "invented or discovered and asexually reproduced any distinct and new variety of plant." The new variety does not necessarily have to be a new species but it must have characteristics clearly distinguishable from those of existing varieties.

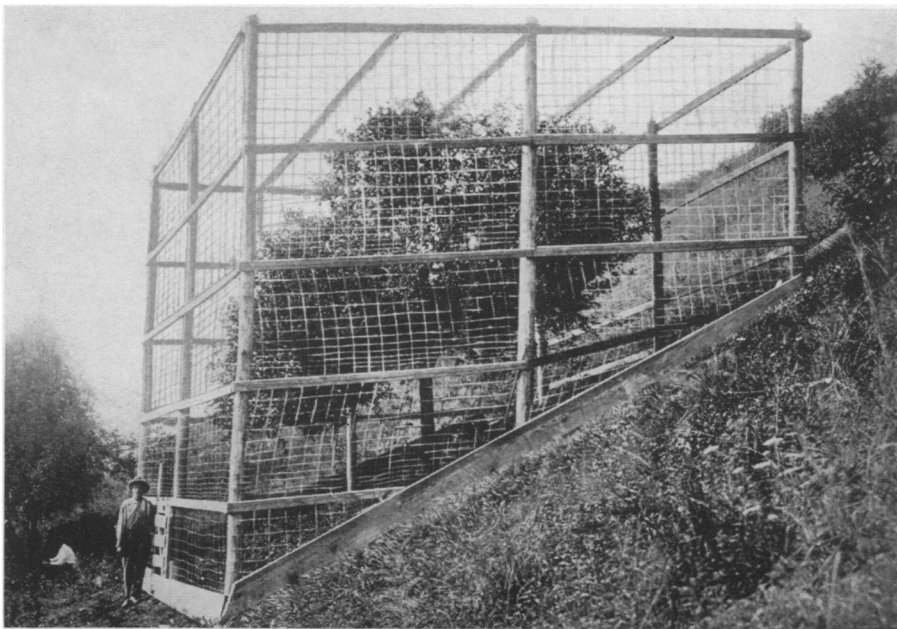
How is a plant "inventor" to describe his new product? Scientists have a pretty good vocabulary for giving the

shape of a fruit or a flower and can do fairly well with colors by reference to standard color charts. But the value of many flowers and fruits depends on odors and aromas, and there is no vocabulary whatever for the description of odors. Just try to write down what a violet smells like, or a Jonathan apple tastes like, and you will see for yourself what the originator of an exquisite and expensive new odor will be up against. In order to make their descriptions clearer, some of the first applications are expected to contain pictures of plants done in water colors.

Another difficulty will lie in the tendency of the original model, itself, to vary. A machine, once made, stays put; it cannot grow or change. But nobody knows whether a Baldwin apple is like the original Baldwins that grew on the first tree of that variety when it was discovered in 1793. The original Baldwin tree is long since dead, and although its thousands of descendants have been faithfully graft-propagated, they have varied a good deal among themselves, and nobody knows which grandson is most like the grandsire.

Suppose you produce a new variety of strawberry, get it patented, and then find it changing into something else before your eyes. Is your patent still good or do you have to take out another one? You wouldn't have to face that question if it were a machine.

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THIS CAGE SUBSTITUTED FOR A PATENT

On one of the Stark Brothers' original Delicious apple trees. It prevented unscrupulous plant breeders and nurserymen from stealing shoots for grafting.