

Perennial Wheats

By L. R. WALDRON, Plant Breeder

THE recent publicity from Russia on the development of varieties of perennial wheat has aroused interest in this country but it is not easy for various agronomists or breeders to give out much definite information. One reason for this is the difficulty with Russian literature. Even if their papers were in our libraries they would be printed in the Russian language. Abstracts of their papers in English are available but it is much better to consult the originals. Requests for samples of seed of their new productions have not been successful so far.

Evidently the first successful crosses between wheat and a few of the wheat grasses were made by N. V. Tzitzin about 14 years ago. Some of the wheat grasses, all belonging to the *Agropyron* genus, are very common in North Dakota for the quack grass belongs here and also our western wheat grass. Crosses in Russia have been made between common wheat and 3 or 4 species of *Agropyron* but these latter are all native to Russia. Only one kind, the elongated wheat grass, has promised the Russians any value in the production of a successful perennial wheat. The first generation plants, using the elongated wheat grass as one parent, resemble the grass parent as to perennial habit, free stooling and a seed size much smaller than the parent wheat kernels. When backcrosses are made to wheat, the wheat size for the kernel is increased but some hardiness is lost. Those who read the article on perennial wheats in the November, 1944, "Country Gentleman" will recall that the wheat, No. 34085, has been under cultivation in an appreciable acreage but was noted as deficient in hardiness and as possessing a wrinkled kernel difficult to mill. One suspects that after milling, flour from this wheat would be regarded critically by our cereal chemists as it evidently would have a high ash content, an undesirable character. In a paper published in Russia some years ago mention was made of constant perennial forms of wheat with kernel weight of 15 to .20 milligrams but some forms had

heavier kernels, up to 25 milligrams. Well developed Thatcher kernels may weigh up to 30 and Mida kernels to 40 milligrams. A wheat with kernels smaller than those of Thatcher might well be considered undesirable by our farmers. One gathers from "The Country Gentleman" article that a really satisfactory perennial wheat is not quite yet in production.

In reading the abstracts of the Russian report one is disappointed in not finding any experimental results. When a new variety is developed in this country by an experiment station it must always undergo critical trials and for that purpose it is grown comparably with a standard variety under various conditions. When a wheat variety is tested for quality it must not only be milled along with a standard variety but the two varieties must have been grown comparably. The different samples of flour are then baked under controlled conditions. If any such comparisons were made with the Russian wheats, no reports are available. Until such reports are available or until the new wheats have been studied by some local experiment station it will be necessary to withhold any definite conclusions as to their agronomic or quality values.

A Winter Wheat Variety

The emphasis has evidently been placed by the Russian experimenters upon the development of a desirable perennial wheat. The difficulties of producing such a variety are not difficult to see but it is not neces-

sary to point them out further in this short paper. The writer would like to point out one goal worth striving for and which perhaps has not been mentioned in any of the Russian papers thus far. One is tempted to imagine the possibility of securing from the wheat-**Agropyron** cross a variety of winter wheat hardier than any now existing. Such a variety might prove to be more valuable than any of our spring wheats. Such a creation might not be possible but certainly it is a project worth undertaking. It might

not be more difficult than was the production of Hope wheat over 20 years ago when McFadden crossed Marquis wheat and an emmer. Hope wheat may have resulted from a chance but happy exchange of parts of chromosomes. It might be far less easy on a second trial to produce another Hope wheat from a similar cross but at least it is potentially possible. And so perhaps a new winter wheat lies undiscovered in some wheat-**Agropyron** combination.

SPRAYS For Killing Potato Plants

Spraying and dusting experiments with chemicals used for killing the potato plants were conducted in Traill County in 1944. Dust applications of chemicals did not effect satisfactory kills. A spray made up of two gallons of Sinox and ten pounds of an activator, applied at the rate of about 173 gallons per acre was applied on August 18, 1944 with the result that about 99% of the plants were killed. In this trial the vines were crushed by rolling an implement over the rows before the spray was applied. A plot sprayed without rolling was killed to the extent of 95%. The experiments were in charge of W. E. Brentzel, Plant Pathologist. They will be continued another year for there is much interest in developing a satisfactory method of killing vines to check possible spread of late blight, to control the digging and marketing period, and to avoid the weather hazards of late harvest.

TREATING Spinach Seed

Cooperative tests were conducted by W. E. Brentzel, Plant Pathologist, and at other State Experiment Stations in 1944 on the value of three different seed treatments, namely, Arasan, Fermate, and zinc oxide as a seed treatment for Virginia Savoy spinach. The emergence in all rows was low, ranging from 36 to 52 percent. The highest emergence was obtained from seed treated with Fermate, there was some improvement in emergence due to treating with Arasan but zinc oxide appeared to cause some reduction in stand. Seedling blight was not apparent in any of the rows.