YIELD AND GRADES OF BLIGHT RESISTANT POTATOES GROWN* IN TWENTY DIFFERENT LOCATIONS IN NEW YORK STATE IN 1947

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Twenty varieties of potatoes were planted in 20 different locations, including Long Island and all of the important potato growing sections of upstate New York. Older 4-H Club boys were chosen as cooperators. The layout was a randomized Latin Square with each replication at a different location. Green Mountain, Katahdin and Rural varieties were used as standards. The remaining 17 varieties were blight-resistants developed by Dr. Donald Reddick of Cornell. Eight of the latter were named varieties and 9 were numbered seedlings.

All plantings were made during the latter half of the potato planting season in each area. On Long Island this period ranged from the 15th of April to the 20th and in upstate New York from the 10th of June to the 20th. It was planned to spray all plots with DDT only, so that blight resistance could be checked as well as the yield and other factors. However because of the inconvenience of not using copper in small section of the regular field, 4 plots did receive copper sprays. Four others received no spray whatever and in those plots, the varieties most susceptible to leafhopper injury, such as Chenango and Snow-

*Paper 300, Department of Vegetable Crops, Cornell University, Ithaca, N. Y.
drift, were killed early and yielded less than where protected against this injury.

All plots were harvested after frost had killed the plants, except on Long Island where they were all mature by digging time—the 23rd of September. Dry weather for eight weeks before frost in the upstate area caused the earliest and least hardy varieties to "mature" before frost.

At harvest, the number and weight of tubers were recorded. The tubers were sized into those over 2 inches and those under 2 inches in diameter. Those over 2 inches were divided into those that would pass the U. S. No. 1 grade standard and those that would not. Those that failed to make the No. 1 grade were divided into the following lots: (1) scabby; (2) misshapen and second growth; (3) sunburn, and (4) tuber rot.

Tubers injured only by insects or mechanical means were included with the No. 1's as these defects were considered unrelated to the genetic makeup of the variety. An analysis of variance of the data showed that all results were significant at the 1 per cent level.

The average yield of the 20 varieties on the 20 plots was 229 bushels of U. S. No. 1's and 337 bushels total per acre. On the total yield basis, 15 of the blight resistant varieties outyielded all three of the standard or blight-susceptible varieties. Fourteen of the 17 new blight-resistant varieties gave higher average yields of No. 1's than any of the 3 standards.

Of the standard varieties Katahdin had the highest yield of U. S. No. 1's over 2 inches—180 bushels per acre. This yield was exceeded by 14 of the 17 blight-resistant varieties and was exceeded by a difference significant at the 1 per cent level, by Essex, DUA-11, Ashworth, Placid, DZE-10, DUA-2, Virgil and DVA-10: and at the 5 per cent level by Chenango.

Green Mountain, the highest yielding of the standard varieties when compared on a total yield basis, was exceeded in total yield by 15 of the 17 blight-resistant varieties. This difference was significant at the 5 per cent level in the case of 8 varieties.

When compared on a basis of the weight of scabby potatoes, (table 1) Ashworth and Essex showed significantly more scab at the 1 per cent level than did CRF-3, DXM-3, EVI-2, FBY-1, Rural and Snow-drift, and also significantly more at the 5 per cent level than Chenango, DUA-2, DVA-10, Empire, Fillmore and Katahdin. When scabby tubers are compared on a count basis the picture is much the same except that only Essex has significantly more scab at the 1 per cent level than the least scabby varieties. As will be seen in table 2, this