

# New York Agricultural Experiment Station.

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OF

BULLETIN NO. 138.

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WORK UPON SOME DISEASES OF PLANTS IN 1897.

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†Connected with Fertilizer Control.

POPULAR EDITION\*  
OF  
BULLETIN No. 138.  
WORK UPON SOME DISEASES OF PLANTS IN 1897.

F. H. HALL.

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DOES GREEN MANURING WITH RYE PREVENT POTATO SCAB?

**A  
common  
belief.** Common farm practice is sometimes based upon error though more often founded upon some scientific truth, unknown, perhaps, but real. Farmers in some sections believe that turning under a good burden of green rye just before potatoes are planted will insure smooth tubers even on soil which has produced a scabby crop the previous season; but experiments made by this station in Westchester County, prove the tendency to be the other way.

**Station  
test.** Notwithstanding the absence of any apparent reason to hope for success—for Science knows no ground for belief that the decay of green rye in the soil will prevent potato scab—it was determined by the Station to give the matter a thorough test.

Upon land of fairly uniform character, which had produced badly scabbed potatoes in 1896, six equal plats lying side by side were selected. All were plowed and harrowed in the fall, and on October 12, 1896, three of them were sown to rye, three alternating plats being left as checks. Though sown late the rye made a good growth and was six inches high when plowed under on April 26, 1897. Two days later the plats were all planted with equal quantities of slightly scabby tubers of Carman No. 1. No fertilizer was used.

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\*This is a brief review of Bulletin No. 138 of this Station on Experiments and Observations on some Diseases of Plants, by F. C. Stewart. Any one specially interested in the detailed account of the investigations will be furnished, on application, with a copy of the complete Bulletin.

## SOUND AND SCABBY POTATOES ON RYE PLATS AND CHECK PLATS.

Manuring.	No scab.	Scabby, but merchantable.	Unmerchantable.	Total.
	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>
Check	785	661	689	2,135
Rye	526	572	793	1,891
Excess check	259	89	—104	244

From the table given above it will be seen that the check plats gave a greater yield of potatoes which were free from scab, a greater yield of tubers somewhat scabbed but still marketable and a smaller amount of unmerchantable tubers; while the total yield was considerably larger upon the plats without the rye. This would seem to indicate not only that the rye is without beneficial effect so far as scab is concerned, but that it increases the amount of scab and decreases the yield.

**Results.**  
**Influence of corrosive sublimate.**

Before the potatoes were planted half of them were soaked for one and one-half hours in corrosive sublimate solution and two of the four rows on each plat were planted with these treated tubers. The different plats showed different results, but on the whole, the treated rows were fully as scabby as the untreated ones.

**Conclusion.**

Green manuring with rye will not prevent potato scab on scab-infested soil nor will soaking the seed tubers in corrosive sublimate. The perfect preventive for this disease, if one exists, has not yet been discovered.

## POTATO STEM-BLIGHT NOT COMMUNICABLE.

**Symptoms.**

Potato stem-blight, as described in Bulletin No. 101 of this Station, is marked by cessation of growth, yellowish or purple coloration of the leaves and rolling inward and upward of their edges, wilting and drying up of the foliage, penetration of the tubers at the stem end by black fibers and spotting and shrivelling of the stems just below the surface of the ground.

**Character.**

The injury from this affection has continued during 1896 and 1897 but its cause is still unknown. It seems, however, to be purely physiological; for neither microscopical examinations nor cultures from diseased

tissues reveal the presence of fungi or injurious bacteria.

Diseases due to fungi or bacteria would be most likely to be continued in plants grown from diseased tubers; but in experiments along this line made in 1897 no indications of such transmission were noted. Badly diseased tubers were planted and nearly every piece used produced a plant although these seemed small and weak at first. Only a few of the vines showed signs of the disease, notwithstanding that weather conditions were favorable and that fields in the immediate vicinity were quite badly affected; and of the fair crop of potatoes produced a limited number only showed signs of the disease. Rows from healthy tubers, however, yielded at the rate of 39 bushels per acre more than those from diseased potatoes, so it is not advisable to plant the diseased tubers if healthy ones can be obtained.

#### COMMON SALT NOT A PREVENTIVE OF CARNATION RUST.

**Another popular error.** Many carnationists believe not only that common salt is a preventive of carnation rust but also that it is a decided promoter of vigor in growth of the plants themselves. Experiments made by the Station have proven that neither of these beliefs rests on a sound basis.

**Salt spray tests.** In experiments made in 1896 (Bulletin No. 100) spraying the plants with salt solution failed to prevent rust in the least and none of the plants seemed more vigorous because of the saline shower. In tests made in 1896 no rust appeared on any of the plants, either treated or untreated; but the "salted" carnations did no better than the others in size or vigor.

**Salt in soil.** In 1896 carnations were grown in soil to which salt solutions of different strength were added and they showed an injurious effect from the salt solution. Five lots of ten plants each were used in this experiment, one lot being untreated and the others receiving from one-fourth of a gram to five grams of salt per plant at each of eight applications about two weeks apart. The non-appearance of rust rendered that feature of the experiment useless; but an experienced carnationist, wholly unacquainted with the treatment given the plants, was asked to pass judgment upon them. He

pronounced the check lot best, the two lots receiving one gram and one-fourth gram per plant about equal and second best and the two lots receiving two and five grams about equal and poorest. Similar results followed a similar test in 1897 and the rust was worse, if there was any difference whatever, on the salted plants.

#### SPRAYING CUCUMBERS.

**Past results.** In Bulletin No. 119 of this Station the details were given of a very successful spraying experiment upon late cucumbers, those grown for "pickles." A profit of \$160 per acre indicated very clearly the advantage of spraying in that instance at least.

**Spraying early cucumbers.** In 1897 an experiment was made on early cucumbers, those grown for sale in the markets for salad. Eight rows of 25 hills each were planted in May and four of them kept well covered with Bordeaux mixture (1-to-8 formula), the adjacent four rows being left untreated. Spraying was begun May 28, Paris green being added to the first three applications to check the ravages of the striped cucumber beetle, and was continued until September 7, 14 thorough applications being made. The season was unfavorable for cucumbers, weather and all enemies seeming to combine against the crop, yet a fair growth was obtained. The bacterial wilt disease revealed itself August 2, and killed perhaps 50 plants on the unsprayed plat but only 5 or 6 on the sprayed section; anthracnose was noticed on August 11, was very destructive on the unsprayed plat and did some damage toward the close of the season on the sprayed vines; and downy mildew appeared August 24 on the unsprayed section and quickly did great damage but it did not affect the sprayed plat at all.

**Results.** For the first two pickings July 26 and August 2, the unsprayed plants yielded more than the sprayed plants, thus proving two things; (1) For this experiment the unsprayed plants had as good a start as the sprayed ones, so that beneficial results must be attributed to the spraying, as that alone differed in the treatment of the two plats; (2) the six sprayings made before July 15 were unnecessary as no disease appeared before this time, and the slight gain from any repression of the striped cucumber beetle was more than offset

by the retarding effect of the Bordeaux mixture on the young plants.

From the sprayed plat 3,263 cucumbers were picked, weighing 1,159 pounds (35 lbs. per 100 fruits) or at the rate of 71,100 cucumbers per acre; while the unsprayed plat yielded 1,866 cucumbers weighing 590 pounds (30 lbs. per 100) or 40,650 cucumbers per acre—a gain from spraying of 30,450 cucumbers (75 per cent) or of 12,860 pounds (100 per cent) in weight of crop per acre.

The thorough spraying gave complete immunity from downy mildew, partial protection against anthracnose and seemed to check somewhat the bacterial wilt disease; and this result was obtained under the very unfavorable condition of proximity to rows in which the diseases were allowed full sway.

Spraying cucumbers need not be begun before July 15, but after that date, on both early and late crops, it should be frequent and most thorough.

**Spraying an isolated field.** In plat experiments comparing sprayed and unsprayed plants, complete protection is seldom attained on the sprayed plats; for the adjacent unsprayed rows or plats are constant sources of infection. Better results should be obtained where entire fields are treated, and to prove this, if possible, an experimental field was selected at Woodbury, L. I. An exact acre of meadow was mowed about June 20, plowed, spread with barnyard manure, harrowed, fertilized liberally with Mapes' Fruit and Vine fertilizer and kainit, and planted June 26 to Early Cluster cucumbers. Eight applications of Bordeaux mixture (1-to-8 formula) were made and careful record kept of "pickles" and gherkins produced. At time of frost, September 28, no downy mildew or anthracnose was visible on any of the vines. As the pickle factories would not receive cucumbers after frost, those remaining on the vines were sold in market. Summarized, the results are as follows:

55,610 "pickles"	sold at factory at \$1.50 per thousand,	\$83.40
31,850 gherkins	" " " 0.75 " "	23.85
1,500 "pickles"	} Sold at Wallabout for	19.00
13,000 gherkins		
101,960		\$126.25

Ordinarily 100,000 cucumbers per acre would not be considered a large yield but for the past season it is uncommonly

large. The average yield per acre of cucumbers on Long Island in 1897 was smaller than in 1896, when it was about 20,000 per acre. In some sections the crop was almost a total failure.

It has been proven by Dr. Halsted of the New Jersey Station that most of the downy mildews **Mildew and hot weather.** thrive best in wet weather; but observations made during 1896 and 1897 would seem to prove that hot weather has more of a developing influence on the downy mildew of the cucumber, *Plasmopara cubensis*, than has moisture. The disease was more abundant on Long Island in 1896 than in 1897; yet in the latter year the period of development of the mildew was much more moist than in 1896. The temperature of the first fifteen days in August of 1896, however, averaged 7° warmer than for the same period in 1897.

**A new  
mildew  
host.**

The downy mildew fungus is now known to attack many plants of the squash, melon and gourd kind, the last one found affected by the disease being the winter crook-neck squash. Upon this the fungus was found in abundance at Floral Park, L. I.