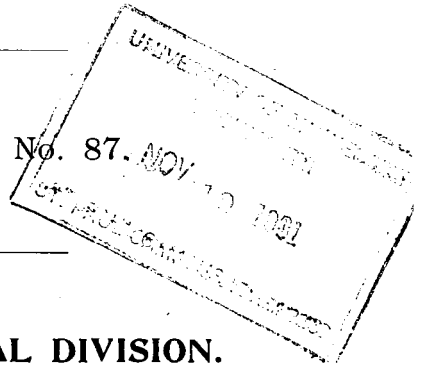


UNIVERSITY OF MINNESOTA.

Agricultural Experiment Station.

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HORTICULTURAL DIVISION.

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POTATOES AT UNIVERSITY FARM.

ST. ANTHONY PARK, RAMSEY CO., MINNESOTA.

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POTATOES AT UNIVERSITY FARM.

PROF. SAMUEL B. GREEN, ASSISTED BY HAROLD CUZNER.

The growing of potatoes in Minnesota is an important industry. Our annual production is from 16,000,000 to 20,000,000 bushels, from one-third to one-half of which are annually exported. The potatoes raised in Minnesota are of exceptionally good quality and are generally sought after in the potato-consuming markets of the United States. Not only are they bought for table use, but the business of shipping potatoes to Missouri, Kansas and other southern points for seed, is an important and growing one.

When potatoes are less than twenty cents a bushel a large quantity of them are made into starch, which industry is of great assistance in maintaining the price of potatoes in this section.

It has been the practice of the Minnesota Experiment Station to grow about fifty varieties of potatoes each year. During the past few years the potato crop in this section has been seriously injured by rot and blight, and in considering the results of the trials of varieties at the station, special attention has been given to noting the power of resistance of each kind to disease. The method followed in growing potatoes used in the experiments here noted, has been to plant sixteen inches apart, in rows thirty inches apart, and to cover four inches deep. The seed has been cut to two or three eyes to a set, using a rather large piece of seed, such as would contain as much in bulk as a rather small egg. One or more rows was planted to each variety, and each row was eight rods long. The following table (Table I.) shows the yield, calculated to bushels per acre, of marketable, small and rotten potatoes for each variety.

By potato rot is here meant both the wet and dry rot of potatoes as they are commonly recognized by potato growers in this section. These diseases are especially troublesome on wet or heavy soils, and in moist, cool weather.

By blight is here meant the diseases that cause dying of the tops of potatoes before the tubers are mature. This is very troublesome in some seasons and often cause much serious loss to potato growers. These troubles generally occur together, but we sometimes have serious injury from blight without having the rot.

TABLE No. I.—Potato Yields calculated to Bushels per acre of Large, Small, Marketable and Rotten.

VARIETY	No. of Rows	Yield per Acre in Bushels				Per Cent. Rotten
		Large	Small	Rotten	Total	
Banner	4	154	8	50	292	20.5
Bartlett	1	143 $\frac{3}{4}$	17	10	170 $\frac{3}{4}$	5.8
Bovee	1	78 $\frac{1}{2}$	19	26	123 $\frac{1}{2}$	21.1
Burbank	4	204 $\frac{1}{3}$	10 $\frac{1}{2}$	66	280 $\frac{5}{6}$	23.5
Clay Rose	2	223	21 $\frac{1}{3}$	244 $\frac{1}{3}$	1.0
Clinton	4	29 $\frac{1}{3}$	6	24	59 $\frac{2}{3}$	42.3
Columbian	2	20	12 $\frac{1}{2}$	10	42 $\frac{1}{2}$	23.8
Commercial	$\frac{1}{2}$	25	5	20	50	40.0
Considerable Seed	2	85	10 $\frac{1}{2}$	40	135 $\frac{1}{2}$	29.6
Early Andes	2	79 $\frac{1}{4}$	18 $\frac{1}{2}$	25	142 $\frac{3}{4}$	10.5
Early Harvest	3	107	26 $\frac{1}{2}$	26	159 $\frac{1}{2}$	16.3
Early Market	1	57 $\frac{1}{2}$	15	25	97 $\frac{1}{2}$	25.7
Early Michigan	2	230	24	50	304	13.1
Extra Early Pioneer	2	67 $\frac{3}{4}$	9 $\frac{2}{3}$	23	102 $\frac{1}{2}$	22.5
Hullet's Rust Proof	1	105 $\frac{1}{3}$	9 $\frac{1}{2}$	10	124 $\frac{5}{6}$	8.0
Irish Cobbler	3	121	14	30	165	12.1
Lincoln	5	117	13 $\frac{3}{4}$	38	168 $\frac{3}{4}$	22.6
Main Crop No. 2	2	56	21	15	92	16.4
Medium	5	153 $\frac{1}{3}$	8	6	167 $\frac{1}{3}$	3.5
New Wonderful	3	108	4	30	142	21.1
Ohio Junior	2	59 $\frac{1}{2}$	10 $\frac{1}{2}$	38	108	35.1
Pat's Choice	$\frac{1}{2}$	57 $\frac{1}{2}$	4	25	86 $\frac{1}{2}$	29.0
President McKinley	1	115	28	38	181	20.9
Pure Gold	1	115	17 $\frac{3}{4}$	30	162 $\frac{3}{4}$	18.5
Peach Blow	2	41 $\frac{1}{2}$	11 $\frac{1}{2}$	9	61 $\frac{1}{2}$	14.7
Sir Walter Raleigh	2	249 $\frac{1}{3}$	7	3	259 $\frac{1}{3}$	1.1
Up-to-Date	3	45	9	20	74	27.0
Vigorosa	2	75 $\frac{1}{3}$	42	32	149 $\frac{1}{3}$	21.4
Vornehm	4	51	12	12	75	16.0
White Beauty	4	221	60	10	291	3.4
White Mammoth	4	137	4	20	161	12.4
Number 26	2	67	12	17	96	17.7
Number 32	2	45	12	22	89	22.2
Number 33	2	45	24	15	84	17.8
Number 34	2	88	6	23	117	10.2
Number 37	2	111	17	8	136	5.8
Number 38	2	67 $\frac{1}{2}$	18	6	91 $\frac{1}{2}$	6.5
Number 39	2	72 $\frac{1}{2}$	20	7	99 $\frac{1}{2}$	7.0
Number 40	1 $\frac{1}{2}$	73	38	35	146	23.9
Number 41	2	63 $\frac{1}{4}$	49	15	87 $\frac{1}{4}$	17.2
Number 42	$\frac{1}{2}$	40	15	24	79	30.3
Number 43	2	64 $\frac{1}{3}$	44	16	124 $\frac{1}{3}$	12.9
Number 44	2	94 $\frac{1}{2}$	60	18	172 $\frac{1}{2}$	10.4
Number 45	2	72 $\frac{2}{3}$	30	24	126 $\frac{2}{3}$	19.0
Number 46	2	63 $\frac{2}{3}$	32	20 $\frac{1}{2}$	116	17.2
Number 47	2	44 $\frac{1}{3}$	31	10	85 $\frac{1}{3}$	11.4
Number 48	2	59 $\frac{1}{4}$	28 $\frac{1}{2}$	4	91 $\frac{1}{4}$	4.4
Number 49	2	62	5	67
Number 50	3	103 $\frac{1}{3}$	37 $\frac{1}{3}$	18	158 $\frac{1}{3}$	11.3

DESCRIPTION OF VARIETIES OF POTATOES.

Banner.—Medium to large; oblong, somewhat flattened, tapering toward stem end; skin, white and smooth; eyes, few and shallow; early, good crop; good market variety.

Bartlett.—Small, round; skin, greenish white; eyes, medium to large and deep; productive, good.

Bovee.—Medium, kidney; skin white, rough, with pink markings; eyes medium size and deep; early; prolific and profitable variety; good cooking qualities.

Burbank.—Large, kidney; russet skin, white netted; eyes few and shallow; late; standard of form and quality for this market.

Clay Rose.—Medium, long oblong; skin rose colored, somewhat netted; large, often deep, variable eyes.

Clinton.—Medium, slightly oblong; skin white, smooth; eyes shallow; productive, vigorous grower.

Columbian.—Medium, oblong, tapering toward stem end; skin light green; eyes medium in size and depth.

Commercial.—Medium to large; irregular; flattened; skin light pink, nearly white; surface irregular, rough; eyes small and shallow; prolific variety; considerable waste in paring; rotted badly in field and more in cellar.

Early Andes.—Medium, oblong to oval; slightly flattened; skin pink, smooth, eyes numerous and shallow; early, good cooking qualities.

Early Harvest.—Medium, oblong, slightly flattened; skin, white and smooth; eyes quite large, medium depth; early, strong grower; good cooking qualities.

Early Market.—Medium, nearly round; skin white, smooth; eyes small, rather long; early.

Early Michigan.—Medium to large; flattened oval to oblong; skin smooth, white and somewhat russeted; eyes small, shallow; good quality; tubers not even in size.

Extra Early Pioneer.—Medium, oblong; skin, white, smooth; tinged with pink; eyes rather shallow and broad; early, average yield for early potato.

Hullet's Rust Proof.—Medium, round to kidney shape; skin white, finely netted; eyes shallow, small.

Irish Cobbler.—Large, short oblong, somewhat flattened; skin, white; eyes medium deep; very productive; good cooking qualities, very white and mealy.

Lincoln.—Medium to large, oblong flattened; skin white, smooth, with faint pink patches; eyes deep and sharp; early crop.

Main Crop No. 2.—Medium, oblong; skin white, tinged with pink, smooth eyes, deep, sharp.

Medium.—Medium, oblong; skin white, slightly netted; eyes small and shallow.

New Wonderful.—Medium to large; oblong, tapering toward the stem end; skin white, heavily netted; eyes small, shallow.

Ohio Junior.—Medium, oblong to kidney; skin white, tinged with pink; eyes numerous, medium in depth; early crop.

Pat's Choice.—Medium to large; oblong, tapering; skin pink, smooth; eyes few, small, shallow, decidedly pink; good bearer; good cooking qualities; early.

President McKinley.—Medium; kidney shaped; skin white, smooth; eyes, deep; early, productive.

Pure Gold.—Medium, oblong; skin white, slightly netted; eyes few, shallow; average early crop.

Peach Blow.—Medium, round; skin, smooth, white, tinged with pink.

Red River White Ohio.—Medium; long, flattened; skin white; good extra early crop; vigorous grower; eyes large, shallow.

Rural New Yorker.—Medium to large; oval, flattened; skin smooth, white; eyes few, large and shallow; late crop; productive.

Sir Walter Raleigh.—Medium to large; round; skin white, with patches of russet; eyes deep; late crop; good market variety; productive.

Up-to-Date.—Medium, round; skin white, smooth; eyes, shallow; late crop.

Vigorosa.—Medium to large; oval, flattened, quite uniform; skin pinkish white, smooth; large shallow eyes; strong vigorous grower; good yielder; fairly good keeper.

Vornehm.—Medium; oblong; skin white, netted; very shallow eyes; good crop; early; very fine cooking qualities.

White Beauty.—Medium to large; long, nearly cylindrical; slightly flattened; skin smooth, white russeted; eyes small, shallow, inconspicuous; good yielder; one of the best keepers.

White Mammoth.—Medium to large; short, thick, flattened; uniform in size; skin white, well netted; eyes small, medium depth; good yielder; reliable market sort; excellent quality.

BORDEAUX MIXTURE FOR PREVENTING POTATO BLIGHT AND ROT.

In the treatment of potatoes with Bordeaux mixture for the prevention of blight, this station was one of the first to get results. In some experiments made in 1889 the vines that were treated with Bordeaux produced 50 per cent more potatoes than those that were not treated, and the tops of the treated plants remained green for perhaps two weeks after those not treated had died down. For a number of years after this we failed to get satisfactory results; trials with it were given up, for while there would often be some increase from the application of Bordeaux mixture, yet the increase was so little that we had come to the opinion that it would not pay to do it. Last year, however, we lost perhaps 50 per cent of our potatoes from rot, and our vines were more or less injured by the blight. In the spring of 1904 we outlined some experiments to test again the value of Bordeaux mixture as a preventative of potato diseases. In these experiments we have aimed to determine the number of applications of wet and dry Bordeaux mixture that would be most effective in preventing disease, and the comparative merits of wet as compared with dry Bordeaux mixture. For description of each of these mixtures see page 4. In Table II. is shown the number of rows in each plot, the yields of large, small and rotten potatoes and per cent of rotten potatoes from each plot. Table III. shows the comparative merits of wet as compared with dry Bordeaux mixture and the check plots.

FORMULA FOR WET BORDEAUX MIXTURE.

Dissolve five pounds of blue vitriol (sulphate of copper) in ten gallons of water in a wooden or earthenware vessel. As this substance dissolves very slowly in cold water, and solutions of it are very heavy, it is well to suspend it near the top of the water. (It dissolves more quickly in hot water.) In another vessel slake five pounds of good fresh quicklime in ten gallons of water. When the mixture is wanted, pour the blue vitriol and lime slowly (at the same time) into a barrel containing thirty gallons of water, stirring all the time. When thoroughly stirred the mixture should be of a clear, sky blue color. After being mixed for a day or two the mixture loses much of its strength so it is well to use only that which has been mixed for a short time.

FORMULA FOR DRY BORDEAUX MIXTURE.

Dissolve four pounds of blue vitriol (sulphate of copper) in two and one-half gallons of water. Slake four pounds of lime slowly in two and one-half gallons of water, so as to give a fine powder, and as a result, milk of lime. In a large shallow box place sixty pounds of air slake lime. In another mix thoroughly the copper solution and the milk of lime. Empty this material into the sixty pounds of air slaked lime and thoroughly mix with a hoe. While still damp this material must be rubbed through a comparatively coarse sieve. It should then be spread out and allowed to dry well and then passed through a 100-mesh sieve.

TABLE No. II. Showing the Results from the Treatment of Potato Vines with Bordeaux Mixture.

N indicates check plot without treatment.

D indicates that treatment was with dry Bordeaux mixture.

W indicates that treatment was with wet Bordeaux mixture.

VARIETY	No. of Rows	Kind of Bordeaux Mixture Used	No. of Times Sprayed	YIELD PER ACRE*				Per Cent Rotten
				Large	Small	Rotten	Total	
Early Michigan.....	2	N	0	124	26	62	212	29.2
	2	D	3	115	26	58	199	29.1
	2	D	6	149	11½	75	235½	31.9
	2	D	2	117	21½	56	194½	28.8
Red River White Ohio.....	2	N	0	60	39½	32	131½	24.4
	2	D	3	108¼	7¾	49	165	29.8
	2	D	6	134½	20¼	60	214¾	28.0
	2	D	2	84	19	46	139	33.0
Sir Walter Raleigh...	3	D	3	134¼	5	43	182¼	23.5
	3	D	6	162¾	7½	35	205¼	17.0
	2	D	2	152½	4½	35	192	18.2
	7	N	0	106	3½	13	125½	10.4
	3	W	3	197½	4¼	43	244¾	17.6
	3	W	6	212¾	3¼	30¼	252¾	11.5
	3	W	2	162	6½	50	218½	22.9
Rural New Yorker..	3	D	3	163½	6	43¾	213	20.1
	4	D	6	172¾	5	30	207¾	14.4
	3	D	2	191	6	37¼	234¼	15.9
	5	N	0	193	10¾	33¾	237¾	13.6
	3	W	3	244	8	53	305	17.3
	4	W	6	231	5	43½	279½	15.3
	3	W	2	227	8	45½	280½	16.0
	5	N	0	189½	8¾	51¾	249½	20.8
	3	D	3	193¾	10	59	262¾	20.9
	4	D	6	179	10¼	53	242¼	21.9
	3	D	2	203	10¾	52	255¾	20.3
	5	N	0	186	10	54¼	240¼	22.5
	3	W	3	276½	9	60	345½	17.3
	4	W	6	472	12½	59¼	543¾	10.8
3	W	2	259¾	4	59¾	323	18.2	
2	N	0	160¾	6¾	52	219	23.5	

* In Bushels.

TABLE No. III.—Shows the Comparative Results from the Use of Dry Bordeaux as compared with Wet Bordeaux Mixture.*

By check is meant the plat that was untreated.

VARIETY	Wet	Dry	Check	Gain of Wet over Dry	Gain of Wet over Check	Gain of Dry over Check	No. of Times Sprayed
Sir Walter Raleigh.....							
Large.....	197	143	106	54	91	37	3
Small.....	4½	5	3½				
Rotten.....	43	43	13	37.7%	85.8%	34.9%	
Large.....	212	162¾	106	49%	106	56%	6
Small.....	3¾	7½	3½				
Rotten.....	30¼	35	13	30.2%	100%	52.8%	
Large.....	162	152½	106	9½	56	46½	2
Small.....	6½	4½	3½				
Rotten.....	50	35	13	5.9%	52.8%	43.3%	
Rural New Yorker.....							
Large.....	275½	178½	192½	96%	83		3
Small.....	8½	8	8½				
Rotten.....	56½	51	47½	53.9%	43.6%		
Large.....	301½	175½	192½	126	109½		6
Small.....	8¾	7½	8½				
Rotten.....	46½	45½	47½	71.4%	56.7%		
Large.....	243	197	192½	46	50½	4½	2
Small.....	6	8½	8½				
Rotten.....	52½	44½	47½	23.3%	26%		

* Results stated in Bushels and per cent.

Wet Bordeaux mixture was applied with a spray pump. Dry Bordeaux mixture was applied with a dusting machine. The number of times these mixtures were applied to each plot is stated in the table.

SCAB OF POTATOES.

A report was made in a former bulletin on the efficiency of the treatment for potato scab, so that it is not necessary to include it here, but a brief notice of this disease and methods of preventing it is given in the following pages, taken from "Vegetable Gardening," by the author.

Scab of potatoes is caused by a fungous plant working in the surface of the potato. The germs of it are very abundant and live for many years in the soil and also over winter

on the potatoes. If these germs are fed to stock they undoubtedly grow in the manure, and the use of such manure may often be the cause of infection. Also they may be spread in the soil by natural drainage and land receiving the drainage from infested fields may become infected with the disease without ever having had potatoes on it. Scabby seed potatoes when planted on new or old potato land will generally produce a scabby crop, but the amount of the disease will generally be much more on the old land than on the new.

Perfectly clean seed potatoes planted on land which is free from the scab fungus will always and in any season produce a crop of smooth, clean potatoes, no matter what may be the character of the soil; but apparently clean seed potatoes may have the germs of the scab fungus on their surface. This is often the case where they have been sorted out from a lot that is somewhat infected with scab. In this latter case, the tubers should at least be thoroughly washed in running water, to remove any germs that may be present, or, what is better yet, be treated with corrosive sublimate (mercuric bichloride) as recommended below.

Land infected by the germs of potato scab will produce a more or less scabby crop, no matter how clean and smooth the seed used.

Scabby potatoes should be dug as soon as mature, since the scab fungus continues to grow on the potatoes as long as they are in the ground.

Scabby potatoes may be safely used for seed provided they are first treated in such a way as to destroy the germs of the scab that adhere to them. There are many methods of doing this, but the most practical now used are as follows:

Corrosive Sublimate Treatment.—Procure from a druggist two ounces of powdered corrosive sublimate (mercuric bichloride); put this into two gallons of hot water in a wooden or earthenware vessel and allow it to stand until dissolved. Place thirteen gallons of water in a clean barrel, pour in the solution of corrosive sublimate and allow it to stand two or three hours, with frequent stirrings, in order to have the solution uniform. Select potatoes as nearly free from scab as can be obtained; put the seed potatoes into bags, either before or after cutting them, and then dip them into the corrosive sublimate solution and allow them to stay in for an hour and a half. If seed potatoes are treated in this way and then planted on land free from scab, the resultant crop will seldom be seriously injured by scab. The expense of this treatment,

including labor, should not exceed one dollar per acre, as the material may be used repeatedly. But the treated potatoes should never be fed to animals, as corrosive sublimate is a deadly poison.

Formaline Treatment.—This material should be mixed with water at the rate of eight ounces (one-half pint) of commercial formaline to fifteen gallons of water. The potatoes should be soaked two hours in it. If this method is used the seed should be planted within two or three days after treatment. This material gives equally as good results as corrosive sublimate. It is slightly more expensive, but the expense is light in any case. It has, however, great advantages over the latter in that it is not so dangerous, and being a liquid is easily diluted for use and may be placed in any kind of a receptacle. This material does not in any way injure the tubers or make them dangerously poisonous. One pound of formaline, costing not more than fifty cents, will make thirty gallons of the disinfecting solution, and is enough to treat fifty bushels of potatoes. If the solution stands a long time it will probably lose strength.

Exposing to Light.—If the tubers are exposed to the full sunlight for several weeks before planting the scab germs will be largely destroyed. It would be a good plan to turn such potatoes occasionally in order to expose them fully to the light.

As the result of following out this method of preventing scab on potatoes at the Experiment Station for more than five years, we have grown potato crops each year that have been nearly free from this disease, and we believe that the farmers of Minnesota cannot afford to neglect this simple and inexpensive method of treatment.

SEEDLING POTATOES.

At the Minnesota Experiment Station we have grown perhaps 2,000 or more seedling potatoes, but thus far have failed to get a kind that is a sufficient improvement over what we now have to warrant its introduction, with the exception possibly of the two or three seedlings mentioned below.

The potato plants of this section seldom produce seed, but occasionally we have a variety that is very productive of seed, such for instance as our No. 2, which seems inclined to produce a large amount, and from this we have raised many seedlings. The best lot of seedlings that we have ever raised were from seed that came to us from J. M. Reed of Wisconsin. In

our experience, potatoes from seed have seldom attained their full size until the second season from the time the seed was sown, but I am inclined to think that unless the potatoes are of fairly good edible size the first year, it is not worth while to keep them longer. In this connection it might be interesting to note that Mr. Luther Burbank, who originated the well-known Burbank potato, and many other valuable plants, told me a few years ago that that potato was of full size the first year.

Of the seedlings we now have on hand those that are most promising are Nos. 37, 40 and 44, which are varieties of good form and productive, and we shall probably send them out for trial in various portions of the state within a few years.

In raising seedling potatoes, we have found it best to separate the seed from the pulp in the same manner as the seed of tomatoes is commonly saved; sow it about the first of April and pick out the small plants into boxes or thumb pots, from which they should be transplanted to the open ground as soon as the weather is settled. The seed grows very readily and it is an easy matter to get more seedlings than one can manage to advantage.

RESULTS.

1. In considering varieties of potatoes as regards their resistance to rot, it should be noted that potatoes of the type of Sir Walter Raleigh and Rural New Yorker have resisted rot better than those of any other class. Only one named variety, the Clay Rose, was nearly exempt from rot, and only one seedling, No. 49, while the percentage of loss from rot in some cases, notably that of Commercial, was as high as 40 per cent.

2. The figures in Tables II. and III. show that in the case of every variety tried, the largest yields were from the rows treated with wet Bordeaux mixture. Dry Bordeaux mixture gave increases in some cases, but they were not so great in amount in any case nor were results from it so uniformly large as from the application of wet Bordeaux mixture.

3. Wet Bordeaux mixture gave very large increases in most cases, amounting to an average total yield of 231 bushels of merchantable potatoes and an average increase per acre of 86 bushels of merchantable potatoes.

4. The cost of applying wet Bordeaux mixture, as judged by our experience, will vary from \$3.00 to \$5.00 per acre where three or four applications are made.

5. The difference in yields between the rows receiving no treatment is not more than will often occur between the rows in different parts of the same field.

6. The cost of applying dry Bordeaux mixture is very much less than that of applying the wet Bordeaux mixture, but the results from its use were not nearly so effective. The average increase in yield due to the application of dry Bordeaux mixture was forty-six bushels of merchantable potatoes per acre in the case of Sir Walter Raleigh as against an average increase of eighty-four bushels of merchantable potatoes per acre for wet Bordeaux mixture for the same variety.

7. Paris green in the Bordeaux mixture gave satisfactory results in killing potato bugs. The proportions used were one pound to 125 gallons of Bordeaux mixture.

8. Many varieties of potatoes that we formerly thought good commercial sorts have shown so great a tendency to disease that we must discard them from our list of profitable sorts. However, where the soil is more favorable for potatoes than here, or where the seasons are more favorable, many varieties that have shown a strong tendency to rot and blight might be able to resist these troubles and become profitable.

9. Over 2,000 seedling potatoes have been raised at the Experiment Station during the last five years, but it is questionable if even the best of these are any improvement over the best varieties now cultivated. Several kinds are promising and have been sent out for trial.

CONCLUSIONS AND RECOMMENDATIONS.

The results of the experiments outlined in the foregoing pages and other experience seem to warrant the following conclusions and recommendations.

1. Potato planters should avoid planting those varieties of potatoes that have shown a special tendency to disease. There is a great difference in varieties in this respect.

2. The soil of the older potato growing sections of Minnesota is apparently badly infested with the germs of potato rot, which will probably be troublesome every year, and in exceptionally cool, wet years, like that of 1904, it will cause serious injury.

3. It will probably pay potato growers, in sections of Minnesota where potato blight and rot have been especially abundant the past year, to spray their potato vines at least three

times with Bordeaux mixture, beginning when the vines are about six inches high and repeating once every two weeks. The aim should be to keep the entire vine well covered with this mixture so as to render it immune to the germs of potato diseases. There are a variety of spray pumps adapted to this purpose. Most of the pumps that work best for applying Paris green in water are adapted to applying Bordeaux mixture. They should have all parts made of brass or copper.

4. Paris green may be applied in Bordeaux mixture without additional expense and with satisfactory results.

5. Potato scab may be successfully held in check by following the precautions and recommendations in this bulletin.