PLANTING, CULTIVATING AND MARKETING POTATOES

C. E. CHAPMAN, Peruville, N. Y.

Mr. Chairman, Ladies and Gentlemen:—I want to ask you all to exercise the privilege of an American citizen and vote for me; I want you to vote fair and square, every person in the room who grows potatoes, whether for his own use or for the market, to raise his hand. Well, there are a good many. Now, I want every man in the room who knows how much it costs to grow a bushel of potatoes to hold up his hand. I think I see three.

Importance of Thought.

You have all read the story of the Prodigal Son, and I am not going to repeat it, but will recall to your mind the fact that he never amounted to anything, and never started back on the road to redemption until he sat down and thought. Unless you people sit down and think you are going to get left growing potatoes. If this discussion shall set us to thinking it will be the best thing that can happen to us.

Why I Became a Farmer.

About the year 1876 I was a drummer on the road and I was a hustler. I was not only a drummer, but I was just a little inclined to be a bummer. I had my attention turned the other way a little bit, and I came to the conclusion that there was no life on earth that was so noble, that was so pure, as that of which the Governor told you last night. I believed that there was no place where a man could be so free from temptation, and could so easily be a man and a gentleman, as on the farm. So I abandoned my other business and bought a farm, run in debt, got married and went to housekeeping, all in a year, and it was a little hard. I had had a pay day every week, but I didn't have a pay day for a year after I went on the farm, and at the end of the year I had a little crop of everything. The land was pretty badly played out, and I said to my wife: "We'll study up a little about this business, and we will go into something that we can make a little money on, or we will quit." So I went to studying.

Study Conditions.

I found that in the State of New York, if I was growing the average number bushels of corn, or wheat, or rye, or oats, and sold it at the average price per bushel, one year with another, I wouldn't receive enough to keep the wolf from the door. I found that growing potatoes I would receive an average of $40.92 per acre, at the average price of the average yield. I knew that the farmers around there didn't have very good methods, and I figured that I could just about get one-third more than their average, which would be about $60 an acre. So I said I would go into the business for five years, make or break, and I would stick to it that long; if at the end of the five years there was money in it I would go on farther; if there wasn't I would quit. I am at it yet. The point I want to make is, that after you have carefully studied you are in a position to make a choice, and I thought five years would be long enough for me to see all sides of it.

Soil for Potatoes.

When the snow melts on the mountains and the rain comes it washes down dirt, fertility and decayed vegetable matter and deposits it on the sides of the mountains until it is ten, twenty and thirty feet of rich, porous, moist soil. These places are where the wild potatoes are found growing, and that is the kind of land you want to grow potatoes on. If you haven't that kind you have to make it if it can be done. If it is clay, cover it with straw and plow it in. The land must be loosened up and made porous in some way. You sometimes swear, perhaps, because you have so much work to do killing weeds. The Creator knew if He made this land without any weeds that you would be so lazy that you wouldn't stir up the soil, you would
starve it to death, and weeds are a wise provision to keep you hustling, tilling the land and making available the fertility in it. In all my operations in growing potatoes I try to keep these natural laws in my mind.

Clover as a Fertilizer.

I don't come here to advocate that you should invest in expensive machinery or buy large quantities of expensive fertilizers. I am not going to ask you to use anything but what you have on your farm. A clover sod is the best for potatoes, and it is better plowed in the fall for the reason that the clover turns into decayed vegetable matter or humus. The difference between a sandy and a fertile field is the amount of humus in it; the office of the humus in the soil is to draw in and hold potash and nitrogen until the plants can use them. Your clover is decaying and giving off nitrogen in a form the plant can use. You have to set your fertility traps in the field, and humus is the best kind. Nitrogen is the most expensive fertilizer that you have to pay for. We pay 17 cents a pound for nitrogen, and if you can raise a good clover crop and save that 17 cents a pound you are just that much better off. Besides the mechanical effect upon the soil, loosening it and raising it up, and holding it is a good thing.

Best Cultivation for Moisture.

The second trouble we meet is a lack of moisture. In no year that you select can you grow any kind of a crop on your soil where all the water that the plants get is simply the water that they get from the clouds. The water falls, soaks down through the ground and keeps going down until it gets to what is called the water level, which varies in different sections. You cannot grow any crop without the capillary attraction in the earth drawing up this water to the roots of the plant. You have seen how a lump of hard sugar will soak up into itself the tea from your cup. So I want to plow my field very deep, I want to give it a great deal of cultivation, which tends to solidify the under part of the soil and make it very fine, and then this water will come up from one particle to another very rapidly, in large quantities, so I must have my soil in the right condition.

Surface Cultivation.

I have got to have exactly the opposite condition on the surface to what I have below, so that you want to cultivate the surface very fine and very loose, instead of fine and solid. After a very heavy rain in the summer the surface of your soil is beaten together, and it will pack and be too solid. You lose all this water that is rising. If you have ever studied the root growth of plants you will understand the importance of the water supply. Let me invite you next summer, about the time that the foliage is about a foot high, to take out pails of water and pour on the potatoes until you wash the dirt off; then take hold of the foliage and lift it up and look at the roots. Some will be two feet long. Those roots have the power to take in food through the surface and as they get larger and the skin becomes thicker and tougher they lose the power to absorb food, and it is taken in at the ends of the roots farther away. A plant never takes its food except in the form of soup; they always eat the first course and no other. To feed a spoonful to a plant you have to mix a thousand times as much water with it before it can take it in. You will be astonished to see the amount of water there is taken up by these roots.

Preparing the Seed-bed.

To produce the conditions necessary I proceed something in this manner: I take a clover or timothy sod, plow as deeply as I can, and keep plowing a little deeper every year until I get it as deep as possible. Draw out the manure through the winter and spread it on this plowed ground; potatoes as a rule do better if you can put the manure on a year before and let it get thoroughly rotted. The fertilizer should be in that form that the young plants can use it quickly and easily. Potato tubers make nearly all their growth in the last two or three weeks of their life. In the spring, after two or three harrowings with the spring-toothed harrow mixing this manure and the earth together I put on a two-horse plow and furrow out this ground in rows three feet apart, plowing as deep
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and as wide as I can. I am changing the location of the atoms of soil which produces a chemical action and helps to make fertility available.

Fertilizers—How to Apply.

If I were going to use fertilizers at all in a small way I would sprinkle them along in the bottom of the trench. Then I would hitch onto a one-horse cultivator and run it through the bottom of this trench, thoroughly mixing this dirt and this fertilizer. Many people think fertilizers don’t pay, and, as a rule, I find that they are the ones who take a small handful and chuck it in a bunch somewhere, or they drop it in one separate stream and find it there in the fall; the roots haven’t been able to get it at all. You might as well put your dinner in the pail and sit down on it and begin to reach around for your dinner. If I was going to use any more fertilizer than 300 pounds to the acre I would put it in the grain drill and broadcast it all over the fields. Sometimes a little fertilizer in the bottom of the trench where the roots can find it in the first few weeks will give them a little send-off.

Planting.

After trenching out I cross-drag it once with a smoothing harrow, drawing back into the bottom of the trench some of the fine dirt and manure and instead of dropping my seed right on the bottom of a hard trench, I have a fertile bed for it to fall into, where there is some fertility, some plant food for it to get in the first two weeks of its growth. Suppose this trench is six inches deep in the first place, then cross-dragging it I would fill it up two or three or four inches with this fine dirt and rotted manure, and I would step on the seed piece and press it firmly into the soil. When I have it planted four or five inches below the surface it is there to stay and is not likely to dry out.

Covering.

If you cover by hand you have to watch your man to see that he covers up the seed in the right way, or he may put a stone on it to hold it down. A boy that costs me 50 cents a day, a team and spring-tooth harrow will cover these trenches at the rate of ten acres a day. I don’t want to say anything against potato planters, but I notice that if a friend of mine wants to raise the biggest kind of a crop for a premium he doesn’t use his planter, and why? The planter compacts the soil and leaves the seed right on the bottom of a hard trench and then puts some more dirt over it and you haven’t the right kind of a seed bed. The planter is all right if the soil is in perfect condition, but if the soil is a little bit wet and you put that roller on there and pack it down tight you can’t grow potatoes in that hard soil.

Care After Planting.

In about a week I begin to drag, loosening up the soil. You drag that piece just as many times as you possibly can, until they begin to prick through the ground. If you don’t have anything else to do it would pay to drag all the time. After the potato begins to come through the ground it will be white and break off easily and you will have to stop your dragging, but after it is two inches high and the stalk is toughening you can push them to the ground and they won’t break off; then you can put on your drag and drag again. If it were not for the fact that after a rain the ground might crack open, I wouldn’t do any more cultivating until digging time. We found that the first rows that we left without cultivating didn’t begin to yield as those that were cultivated, simply on account of the conserving of the moisture.

Why We Harrow.

The point that I make in using the harrow to cover up and to drag so many times is that your cultivator doesn’t kill the weeds, doesn’t loosen up the dirt where it is needed, and isn’t much good. The first time you can run your cultivator pretty deep if you want to, but the next time line up and run it shallow; after that don’t go more than two inches. If I can’t make a cultivator run shallow I put on wheels behind. You see the ground is full of roots, and if you cut them off you have destroyed the source of supply. Where do we get this hilling system from? It came over from Ireland, where the land is very wet and they
had to plant in hills to keep out the water.

Deep Planting.

There are two advantages in planting deep. By planting deep the potatoes will be three weeks or more coming up, and you can plant any time you choose in May, and they won't come up to be frosted. The second point is, that by lying under the soil the first crop of bugs is gone, and the third point is, that the deeper you can plant a seed of any kind and the longer it is in coming up, within reason, the longer and darker and tougher it will be when it does come up.

Again, nobody ever saw a tuber attached to a stalk below the seed or above the surface. If you plant them deep they have a long stalk for the tubers to attach themselves to. Just as soon as these tubers begin to grow, if they are planted shallow they are going to stick out of the ground and you are obliged to go to work and hill up in order to give them shade. Then the sides of the hill will be heated up and dried out; then it will radiate that heat at night and become cold. With deep culture you never have to hill up and they never need become chilly at night.

Harvesting.

With two horses and plow turn the dirt from each side of the hills. The loosened ridge is easily turned with a hook. Divide the men and let each dig his share of each row. When all work together the slowest man sets the pace. Boys sort and pick up for one cent per bushel. Always sort for market as dug. Do not let them lay in the sun after once dug. Use crates; they save much work. The best form of crate is long and narrow, because this spreads the hands and brings the weight nearer the body. The following size will fit in a wagon box, into each other and hold a bushel: Twenty-two and one-fourth inches long, 12 inches wide and 11 inches high. The ends are solid pieces about three-quarters of an inch thick. There are three slats three-eighths inch thick and three inches wide on each side and on the bottom. Hardwood ends and basswood or other light wood slats.

When to Market.

If the price is low and the yield only fair it generally pays to store until February or March. The profits are greater on an average than any other farm crop, providing a system is pursued which gives an average yield at a small cost.

DISCUSSION.

Mr. Nicholai—I have a piece of tiled land where I have had potatoes for eleven years in succession. It is sheltered, and, of course, it is only the potatoes that are plowed in deep in the fall that will live through the frost and I have noticed they come up rank, dark-green foliage, but the potatoes are very small invariably. They are getting smaller every year, and I have had them all in the ground too deep where it is cold.

Mr. Briggs—What does it cost to raise a bushel of potatoes?

Mr. Chapman—I have made that quite a study and I have come to the conclusion that if a man will study honestly into the subject, no matter what it is, and work it down through to the last analysis of the whole thing, that you always come to one point, that is, the man who is doing it. One man will raise them for one price and another at another. If you will tell me who the man is, and I know him, I will try to tell you.

The Chairman—His name is Chapman.

Mr. Chapman—I don't know him. I can grow potatoes at $25 an acre. If I had 200 bushels to the acre that is 12½ cents a bushel. If I have a hundred it is 25 cents. In one particular instance I grew potatoes at $40 an acre and I got 400 bushels. I believe it is possible to grow them at from 12 to 15 cents a bushel.

The Chairman—You figure interest on your land at how much?

Mr. Chapman—At the cost I paid for the farm, 5 per cent. That includes everything, the same as if you grew an acre of potatoes for me and I paid you for it. I allow $3 a day for plowing and dragging of the soil, and I paid $30 an acre for this particular piece of soil. I allow $1.50 interest, I allow the taxes, I allowed eight bushels of potatoes at
market price, I think 50 cents a bushel, for seed, and everything in the same way.

Mr. Olds—Can you tell us how much it cost you to plant?

Mr. Chapman—I think that they cost me 8 cents a bushel up to digging time, and the digging cost me too much.

Mr. Olds—How much an acre does it cost when you plant by hand?

Mr. Chapman—I haven’t the figures of that alone.

Mr. Olds—I think you left the impression that you considered your way of planting cheaper than the machine planting.

Mr. Chapman—No, I beg your pardon. I meant to leave the impression that it was a more perfect way; that it would grow a larger crop, but perhaps the planter would be a little cheaper.

Mr. Olds—that may be true for you where you do the work yourself, but I maintain that the Aspinwall does better work than the ordinary work we can get done by a man, and a great deal cheaper. If a man has five acres of potatoes, it will pay him well to have a planter.

Mr. Noyes—I think that the objection that Mr. Chapman has to the planter would not be found in plowing in the spring as we are ready to plant, as a great many of the Wisconsin potato growers do. I will say it costs me $25 an acre to raise and market an acre of potatoes, one year with another, and it averages me 16 cents a bushel.

Mr. Brown—I have been with Mr. Terry this winter in Institute work and we have spoken about this very thing. The planter that Mr. Terry has previously used is one that does do harm by compacting the soil as it leaves a V-shaped trough, pressing the soil to each side. The planter has been improved since then so that it goes through and furrows the soil, leaving loose soil underneath for the potatoes to be dropped into. Mr. Terry says that now he could buy a planter that would work all right.

Mr. Cole—Do you plant your potatoes lengthwise in the furrow?

Mr. Chapman—Yes.

Mr. Cole—How many do you drop before you commence covering?

Mr. Chapman—It depends on the day. If it is hot and dry we drop a few and start and let the team go a little bit slanting across the corner, and keep covering about as fast as they are working. If it is a dark day and they won’t dry out, they won’t hurt. I have tried to be practical in talking to you. If you are growing fifteen or twenty acres it may be all right to buy a planter, but you could not afford it on an acre.

Mr. Todd—How deep do you call very deep plowing?

Mr. Chapman—When you get your plow so that it goes nine inches deep by measure, I call it quite deep. The trouble is, men tell about plowing twelve or thirteen inches deep, but I will bet a dollar they never measured. According to my idea, the deeper your soil is, the more that it is stirred up the deeper the roots can go, and the farther away they can get from the sun and drought the more water there is, the better crop you will get.

Mr. Briggs—I think the kind of soil makes a difference. In our light soil we don’t need to plow so deep.

Mr. Chapman—You must not look for the advantage of deep plowing the first year, and you must not look for it at all if you do not fill the soil with vegetable matter.

Mr. Todd—Do you fertilize by plowing?

Mr. Chapman—Yes, sir. It amounts to that.

Mr. Briggs—That varies in different countries, too. In some of our countries the fertile soil lies near the top.

The Chairman—I have raised a few potatoes for a great many years, and so did my father and grandfather. My great-grandfather, I don’t know where he came from, but he brought the habit of making these conical hills. Of course I followed in their footsteps, and I didn’t always have satisfactory results. I went to the Farmers’ Institutes, and I listened to Mr. Terry and Mr. J. M. Smith, and they said: “Don’t hill it at all, have it level.” Well, I followed their plan, and what was the result? When I came to dig my potatoes nearly half of them were sunburned. Then I went to these gentlemen, and I said: “When you talk about level culture, do you mean absolutely level culture?” and I told them how the ground cracked over my potatoes and it let in the sunlight and burned them. Mr.
Smith said: "What kind of ground is yours?" I told him it was strong, clay ground. He said: "I guess you had better hill up a little to cover up those cracks."

Mr. Chapman—The soil I am used to handling is what we call a chestnut loam—not much clay about it, and lots of stones. That soil does not bake and crack open. In this plan of cultivation there will be some dirt that will work out toward the row a little, but we never put on wings and hill up the way we used to, although there is a little dirt gets up there.

The Chairman—That is just what I wanted to get at. They will grow in the direction of the least resistance, and that is up, but Mr. Smith's ground was so very mellow that the least resistance was down; they hadn't anything to press against.

Mr. Chapman—The great thing is to get your soil loosened up, and full of humus.

Mr. Frost—Mr. Chapman says that tillage is fertility. I think that we have been taught that it is the mechanical effect of the soil which is the good of tillage.

Mr. Chapman—When you change the position of the atoms of the soil and bring two other atoms together, which were not in contact before, there will be resulting chemical action. I mean that tillage produces an effect upon the soil which shall make the fertility that is in the soil available.

Mr. Howe—I picked up a little pamphlet and I read that there was such a thing as a potato bleaching after being cut for seed, and I was interested, because I had planted some which did not get above ground for three weeks, and I found that those large pieces were all damp and had not even sprouted.

Mr. Chapman—I don't think that will hurt them. I don't practice the drying of my potatoes in the sun or anything of that kind. We go into the cellar for two weeks before planting time on rainy days and cut up this seed; we sprinkle on a little land plaster, that dries it up. We put them in a potato crate and they stay there until planting time. The eyes will swell out a little and they are in fine condition for planting. If you put them into a barrel, they will heat, and perhaps be hurt.

Mr. Everett—Tell us about the Bordeaux mixture, and what you do for the potato bugs in New York.

Mr. Chapman—The Bordeaux mixture will prevent the rot if you get it on before the rot gets there, that is it is a preventive, not a cure. We have millions of potato bugs. We mix Paris green and plaster together, and put it into a little tin sifter with a handle on and sprinkle it over a hill in small quantities. The majority of people who fail in killing bugs and declare that Paris green isn't good for anything fail because they wait until the bugs are one-half or two-thirds grown before they put it on, and then they are careless and leave about two-thirds of the hill untouched, and the bugs will travel over to the part that hasn't any on and stay there. In large fields the spray pump is cheapest and most effective.

New Bordeaux Mixture.

At a meeting of the National Agricultural Society of France an improved Bordeaux mixture was suggested with the object of removing certain objections to the one now so largely used in this country. It has the advantage over the old mixture in being less injurious to foliage, less liable to be washed away by rains, and less liable to choke the nozzle of the spraying machine. The new formula is as follows: Quicklime, 4 pounds 6 ounces; molasses, 4 pounds 6 ounces; sulphate of copper, 4 pounds 6 ounces; water, 22 gallons. The essential difference between the new and old formulas is the presence of the molasses, which has a greater influence than would at first be expected. The method of mixing is to add the molasses to thirteen gallons of water, then slack the lime and add four and one-half gallons of water to form a milk of lime. Pour this slowly into the sweetened water, stirring briskly in order to mix intimately. Next, in the third (wooden) vessel dissolve the bluestone and pour this into the previous mixture, stirring well. In this blending of materials chemical changes are taking place. When the milk of lime and sweetened solution are intimately mixed together, then saccharate of lime is formed. Next, when to this is added the solution of sulphate of copper, a double decomposition takes place; sulphate of
lime is formed on the one hand and soluble saccharate of copper on the other. This saccharate of copper is only formed in presence of an excess of lime, and its formation is indicated by the mixture assuming a beautiful greenish tinge. Thus the mixture is rendered alkaline, and the acid is neutralized by the lime.—"Farmers' Review."

MARKET GARDENING.

DELBERT UTTER, Caldwell, Wis.

In no other country is it necessary for the tiller of the soil to change his mode of farming, and vary his products as in this. In Europe the son follows in the footsteps of his father, growing the same crops in the same manner, from generation to generation. But here, with the competition of our cheap Western lands and increasing facilities for transportation, we are brought to face new conditions, which must be met with new methods, applied to more profitable branches of farming than wheat-raising, wool-growing, or beef-making.

The farmers of Wisconsin are well located for choosing from some of the branches of farming which are profitable under the conditions with which they have to contend. Of these branches market gardening is receiving considerable attention.

Adapt Crop to Soil.

Situated as we are near two of the largest cities in the country, one of which is destined to be the largest in the world, there is certain to be a demand for all that will be grown, at remunerative prices. For the best results the soil should be adapted to the crop grown. If we cannot choose our soil, then grow only such varieties as are adapted to such soil as we have, and the man growing them must be well adapted for this particular line of work. He cannot do garden work with a sulky plow, self binder and hay loader, but his work must be performed with more carefulness and with closer attention to details than any other line of farming; in no other is it more important that this work should be done at just the right time. Doing this at the proper time, or delaying often makes the difference between a profit or a loss in the crop.

Need Excessive Fertilizing.

For early potatoes, sweet corn, tomatoes, melons, and all vine crops we should choose a sandy loam, while for cabbage, cauliflower and celery a well-drained black loam is needed for the best results. In this state there is a large area of marsh lands that are now producing nothing but wire grass which can, by proper draining and fertilizing, be made excellent garden land for crops requiring a moist, cool