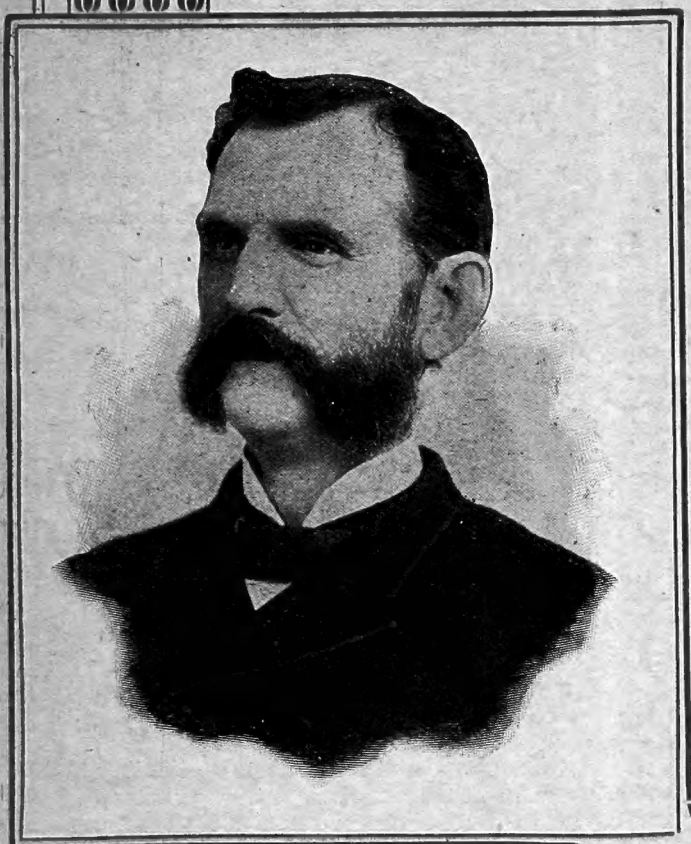
1898

R. M. KELLOGG'S

1898

A TEXT BOOK
... FOR ...
PROGRESSIVE
FRUIT GROWERS.



GREAT CROPS OF SMALL FRUITS

AND HOW...
HE GROWS
....THEM

WITH FULL INSTRUCTIONS FOR

BREEDING
PEDIGREE
PLANTS

THE LARGEST CROPS
THE FINEST FRUIT
THE LEAST LABOR

THREE RIVERS, MICH.

ROBERT SMITH PRINTING CO., LANSING, MICH.

OUR HOME—THE "PRODUCT" OF A STRAWBERRY PATCH.

PLANT BREEDING.

There is a distinction between plant breeding and propagating. The former includes systematic selection through a series of years with the definite object of improving the plants in general vigor and fruiting stamina.

Propagating as practiced by nurserymen generally is a mere multiplication of the variety without regard to the history or pedigree of the plant.

The Stock Breeder who should breed from anything or everything would soon find his herds and flocks an unprofitable mass of mongrels.

Bud Variation, or the continual breeding from those which vary in the right direction and discarding those which vary in the wrong direction, must eliminate weakness and give greater returns for labor expended.

The Government has established extensive and well equipped experiment stations in all the states for the purpose of carrying on experimental and scientific work, but in no case have they attempted to supply commercial growers with improved strains of plants. In looking over the country no place could be found where work was being done along these lines.

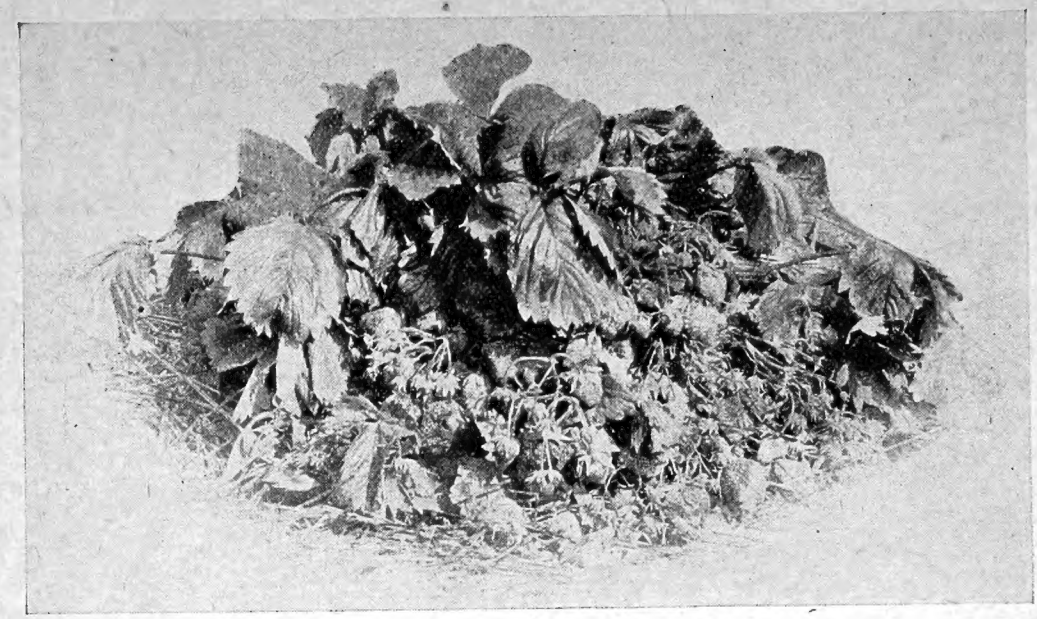
Having had a life interest in horticulture and fifteen years especially devoted to this work with most gratifying results I determined to provide myself with ideal facilities and devote my entire time to it.

The present grounds were selected after a search of many weeks throughout the fruit belt of this state. The soil is ideal strawberry land on an elevated plain for which we have provided complete water works for irrigation.

Our testing and experimental grounds will contain every leading sort of small fruits grown in this latitude and only those showing especial value will be catalogued.

Visitors are cordially welcomed and entertained free of charge. The city hacks meet all trains and carry visitors free to the grounds, only a half mile distant.

The city of Three Rivers is noted for its extensive manufactures, elegant residences and beautiful streets and drives and you will find a visit both pleasant and profitable. The city is situated at the crossing of the Lake Shore & Michigan Southern and the Michigan Central railroads, both of which connect with the Belt Line railroads at Chicago, Toledo and Detroit, so that freight and express are immediately transferred to all railroads radiating from those cities, giving unequaled shipping facilities.



Photograph of a Haverland Pedigree Plant which produced 4⅓ quarts of berries.
A part of foliage was removed to show the berries.

HOW I GROW GREAT CROPS OF SMALL FRUITS.

For the past fifteen years I have produced the largest crops of the finest fruit, and I base my success on the high fruiting vigor of my plants, together with my improved methods of cultivation, as explained in the following pages.

From the plats of each variety careful search is made for ideal plants or those showing the greatest tendency to make large crowns, stocky runners and healthy foliage. As many of these plants are found as possible and staked, and a record is made, based on one to ten, and from the one having the greatest record runners are potted and taken to a special propagating bed, and that becomes the parent plant of that variety on the farm. The ideal plant selected is allowed to mature a limited number of berries, to encourage and develop its powers in that direction and show the variations of its fruit, so we may score it in that respect. The next season plants for the fruiting fields are set from these runners, and again selected in the same way, so that we are constantly accumulating good qualities and discarding all weaklings or those varying in the wrong direction.

Plants are male and female, and their sexual organs are perfect and have all the named parts of those of an animal, and fecundation takes place between them for the multiplication of their species. It is their intense passion for breeding, or seed bearing, which renders them impotent or unfruitful.

Pollen exhaustion. This is the great source of unfruitfulness, and throughout the country I know of few plantations not suffering from it.

The seeds are the eggs of the plant, and all fruit grows as a receptacle for the seeds to grow in and if the seeds are not fertilized no pulp or fruit will develop, or if the pollen lacks potency or strong life-giving power no process of cultivation will cause the plants to produce large, luscious fruit.

You can increase the foliage and raise large numbers of runners, but when it comes to bearing fruit the impotency manifests itself, and the plant remains wholly or partly barren. You have often seen your berry fields white with bloom, making a great showing of flowers, but when the harvest came the largest part were too small to pay for picking.

See that apple orchard, how beautiful it is! Every twig covered with bloom, "smothered in flowers," yet in a few days the ground is

SEEDS AND EGGS.

strewn with little embryo apples and the few remaining are gnarly and flavorless. What is the matter? The tree had no power to fertilize so many blossoms and of those pollenized the potency is so low the fruit could not fully develop.

A light crop of apples always follows excessive bloom for several years or until the tree recovers. The largest crop of fruit always comes from moderate bloom, as was seen in the great fruit crop of 1896.

Pollen exhaustion in strawberries. All the fruit buds of the strawberries are formed in the fall and are ready to burst into bloom as soon as warm weather appears in the spring. They are then taken up and transplanted and before their roots can become established to sustain the plant they are forced to undergo the great strain of pollen secretion. The constitution of the plant is weakened and its fruiting power greatly diminished. This is

continued every year with the average grower until his plants "run out" or in other words have fruited themselves into impotency.

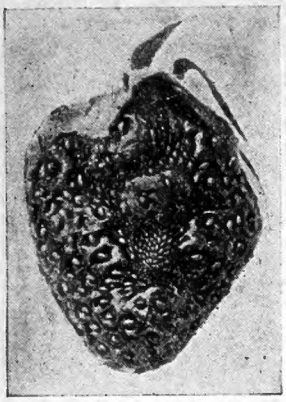
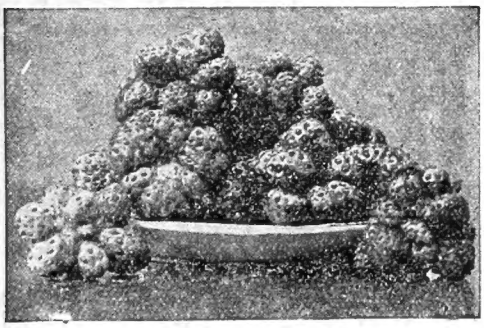


FIG 2. LACK OF POLLEN.

There are certain plants which produce fruit without seeds, as the banana, orange, pine apple, etc., but they are freaks. No one ever saw a large luscious berry without the fullest development and vigor of the seeds. Take an apple with a shrunken side and cut into it, you will find no seeds on that side. Where seeds are lacking or are infertile in a strawberry, there is no fruit. See figure 2.

The foliage shares in the weakness and falls an easy victim to rusts and other fungi which the plant, strong in fruiting vigor, would readily resist.

A strawberry runner is only a bud of the old plant and contains all the weakness or diseases of the old plant and whatever tendency to barrenness or making fruit buds they may have



UNDEVELOPED STRAWBERRIES, SHOWING LACK OF POTENCY IN POLLEN.

will be found in the new runner except so far as it may be strengthened by being placed in new, rich soil.

Prevention is the remedy. Stock your grounds with pedigree plants and prevent exhaustion by setting in the spring while they are dormant and cutting off the *blossom buds* before they open. Keep off runners and give thorough tillage to induce the rapid formation of fruit buds the first year.

For setting plants the next season take runners from the plants set this spring and vigor can be maintained for many years.

Few growers, even those who have been in the business for many years, have any conception of the possibiiities of a strawberry plant or the amount of fruit which can be grown from a single acre.

Our crops have rarely gone below two hundred bushels per acre and often reached four hundred bushels and have exceeded five hundred bushels, and in all these years we have never had an unprofitable crop. While you may not be able to secure the same results under your environments and soil, yet with a careful study of this pamphlet, aided by such pointers as I may be able to give you by correspondence, you may be reasonably sure of approaching it very closely.

BUD VARIATION.

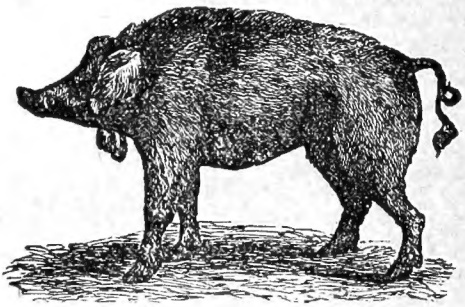
All varieties of plants sport more or less; that is, they change from the usual type both in fruit and foliage. Sometimes they are larger, finer flavored and more desirable in every way. Then again they are much inferior. The general tendency is to go back to the wild state.

We may take advantage of this variation and fix our ideal of what a plant should be, and every year accumulate good qualities by propagating year after year from those which vary in the right direction until they reach great perfection. Long continued selection will fix the characteristics of the variety so the tendency to reversion or going back to original type has disappeared.

To say that one plant is as good as another to propagate from is as much of an error as to say that all animals are exactly alike for the purposes of breeding.

A PEDIGREE PLANT.

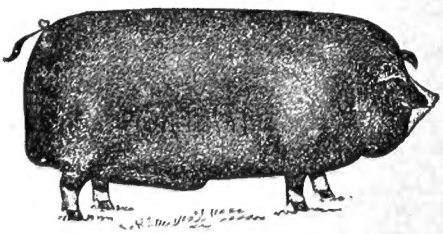
A pedigree plant may be defined as one possessing the greatest number of good qualities in the highest perfection, which have been accumulated through the habit of bud variation in plants by long continued propagation from



THE ORIGINAL HOG.

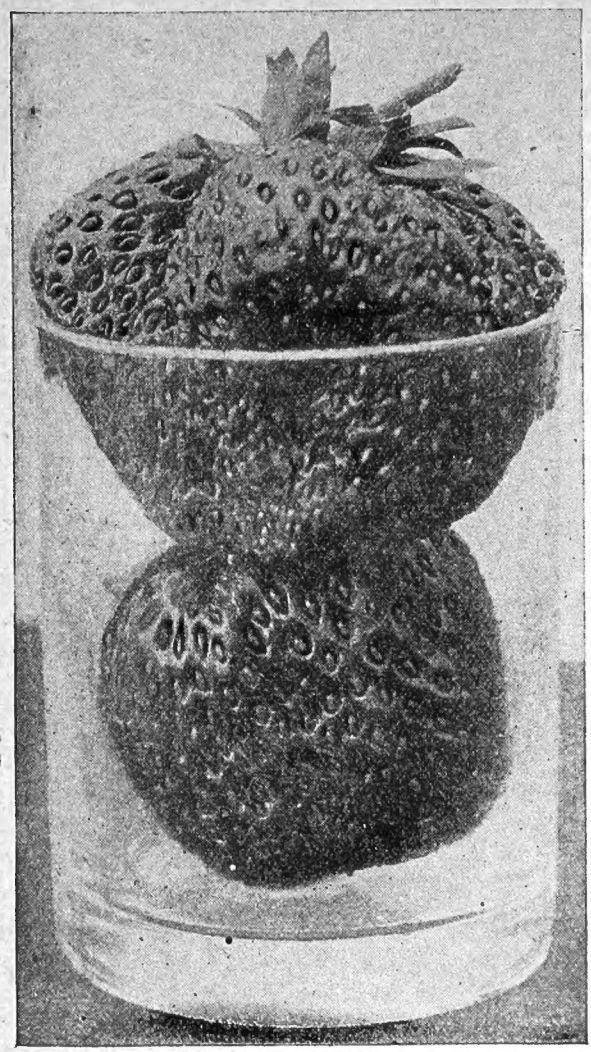
ideal plants, and by keeping them under restriction to prevent pollen exhaustion, resulting in great productiveness, health and vigor of foliage, and loss of tendency to reversion.

A scrub plant is one low in fruiting vigor,



BRED UP BY SELECTION.

variable, and in every way inferior. It generally blooms quite full but is lacking in potency of pollen and with weakened pistils, its fruit does not set, or if berries do form the lack of stamina prevents them from attaining size and quality. Sometimes one berry receives the



A Glass of Berries Photographed, exact size.*
THE MARSHALL.
THE BISMARK.

whole strength of the plant and develops at the expense of all the rest, hence the berries in the box are so uneven in size they do not present an attractive appearance.

Growers have generally fruited their beds two or three years and then used the runners to start a new bed. The old standard sorts have been largely run out by this method of cultivation.

A few more careful growers have taken from plants set the previous year but generally from "titman plants" or the last formed along the edge of the full matted row, but not having enough they resort to the old bed to complete the number required, and next year taking from the new beds indiscriminately produces a mongrel mass.

Where beds are allowed to fruit two or three years the ground is covered with inferior berries too small to pick. These are cultivated in and the seeds grow. They resemble the parent plant but are very inferior, coming as they do from the poorest berries.

These mongrel seedlings usually make runners in great profusion and soon crowd out the genuine plants. Nurserymen have contributed to the production of mongrel plants by making plant growing a side issue and maintaining "stock beds" for several years, often selecting the low or muckland for the purpose, because plants form rapidly on such soil.

A TEST.

Take a Pedigree Plant and set by the side of a common mongrel plant, and give both high culture. Notice that the Pedigree Plant throws out strong runners and its crowns form rapidly, while the mongrel plant will throw its whole strength into making a profusion of runners, and in the fall the mother plant will have very few or no extra crowns and the runners will have few double crowns. The following season the difference in the berries will be very marked, both in size and quality of fruit.

This experiment we have tried time and again, with the same results. The vigor of the plants set makes the difference between big crops with large profits and little crops and no profits.

CONDITIONS OF SUCCESS.

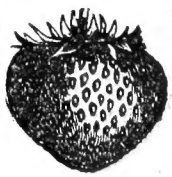
BOILING DOWN.

We may now condense what has been said in previous pages into the following propositions:

I. Like begets like in plants as well as animals, and a scrub cannot beget a thoroughbred.

II. A runner from a scrub plant makes a new scrub plant, and a runner taken from a thoroughbred plant possesses the good quality of its parent.

III. After a plant has once produced a heavy crop of berries its fruiting vigor is so impaired that plants should never be taken from it to start a new bed.



WILD BERRY.

IV. Unrestricted pollen bearing produces impotency and the seed-bearing stamina of the plant governs the development of fruit.

V. The low price at which our Pedigree Plants can be obtained does not justify the use of scrub plants. A scrub plant cannot respond to liberal culture because it has no power to do so.

VI. The difference between a big crop of high priced berries and a small crop of low priced berries is often decided by the vigor of plants alone.

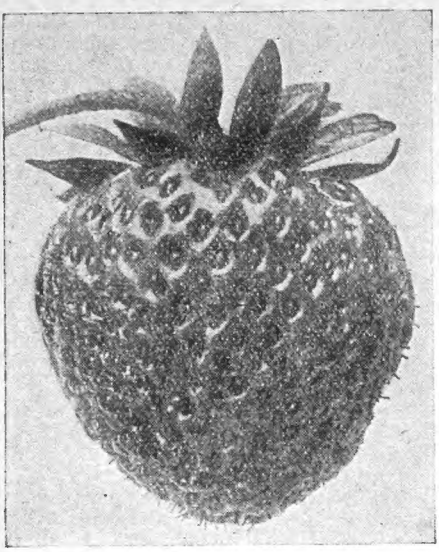
VII. Success comes from love of fruit growing and making money out of it.

GROW YOUR OWN PLANTS.

The propagating bed is the fruit growers' gold mine. Select high ground, loamy soil, make it moderately rich and set plants four

*The illustrations are photo-engraved from the original berries, expressly for this work.

feet apart each way. Give the most thorough cultivation, keeping the surface loose to conserve moisture. When runners start spread them out in all directions so each shall have

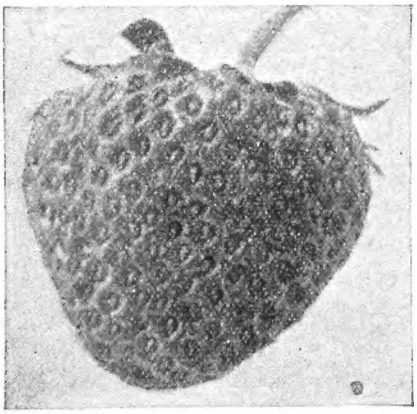


THE MARGARETT.

plenty of sunlight to encourage the tendency to form fruit buds.

Layer each runner as soon as leaves form by laying a small stone or some soil on them so they will root quickly. The plants will be all the better if some system of irrigation can be had to maintain moisture.

Under no circumstances select low ground. You can get great quantities of plants but they will be weak and lacking in all desirable qualities. As soon as ground is frozen in the fall, mulch with straw or chaff and in taking them up in spring, discard all tip plants and those of immature roots. When plants are taken up for re-setting alongside the fruiting bed as is usually done, very many are tip



CLYDE.

plants with immature roots, and the new plantation is sure to be spotted and irregular from which you cannot expect a full crop of fruit.

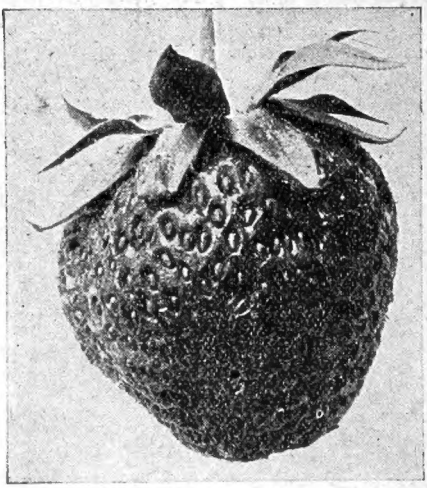
If you desire to fruit your bed the second and third year, order a few Pedigree Plants the year before, and grow the plants needed for renewing your own grounds.

CHEAP PLANTS.

Since small fruit growing has become a leading and profitable industry there has been a large demand for strawberry plants. Many persons have secured low land with a quick sand subsoil which causes the plants to become viney, that is the soil forces them into making a mass of runners, crowding them together over the entire surface of the ground.

It is needless to say that plants propagated in this way lose their tendency to form fruit buds. Several of these parties have even advertised Pedigree Plants, offering them as low as $1.25 per 1,000, assuring customers they only weigh twelve to fifteen pounds per 1,000 plants, packed. Any planter can readily understand that plants which weigh only that amount are very inferior in every respect. They could not be otherwise.

Genuine Pedigree Plants weigh on an aver-



GLENN MARY.

age at least three times as much, and it is an absolute impossibility to grow them and put them on the market at that price. There is an old and true maxim that when a man is so anxious to do so much for you without reasonable pay he is a good man to let alone. When the harvest comes you will find these "cheap" plants are *very expensive*. A thing is never truly cheap unless it has *value*.

PLANTS FOR THE SOUTH.

All the leading truck and berry growers in the south use only northern grown seeds and plants for the reason that the northern summers are very short and hot and they acquire the habit of ripening their fruit several days earlier than the same variety propagated at the south.

The new runners will retain these characteristics for three or four years so that southern planters can get the benefit of this and propagate their own plants for that length of time and then renew their propagating beds with northern plants and thus be in the market

several days in advance and secure the high prices, making a big difference in profits with very little extra expense.

The spring at the north being several weeks later than the south, plants remain entirely dormant that much longer and will endure shipment and transplanting in this condition with perfect safety and when put in the warm soil will spring into a fine growth at once. The old foliage of dormant plants is nearly all removed by trimming and packing and the new roots start immediately so the plant becomes established with feeding roots before it has foliage to be affected by the sun.

We take up plants as soon as frost is out of the ground—usually the last of March and first of April.

Northern growers can not use southern plants successfully because they are in fruit in the south before ground in the north can be fitted for transplanting. While dormant plants can be kept even weeks in mild weather by heeling in, yet, after they have commenced to grow, it is difficult to save them in this way.

From points as far south as Maryland and Kentucky they are obliged to ship as early as February and March and even then plants have commenced to grow, so it is almost impossible to heel them in so as to keep them during the freezing weather of those months at the north. If shipments were delayed until northern ground could be fitted, the fruit would be half grown and at this period there is a change in the roots so that they very rarely succeed when transplanted at that time.

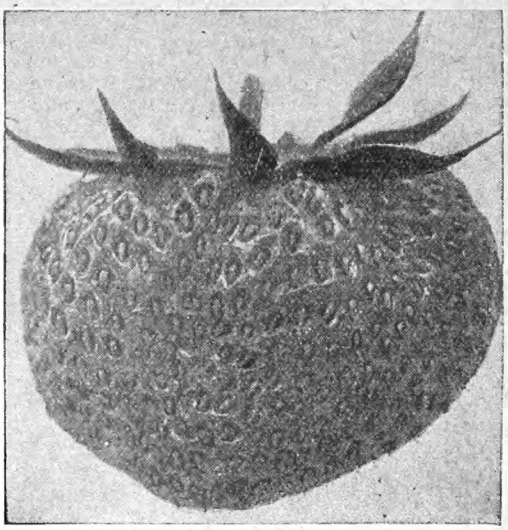
THE FIRST AND SECOND FIDDLER.

The first fiddler is a high-priced fellow. He has won a reputation for furnishing fine music and he will not and need not play for less than $25 per night,—often much more than that. They send for him from far and near. He takes pride in his business, uses only the *best fiddle* to be obtained and never furnishes second-class music. He finds a world of pleasure in his business, has a delightful home and pleasant surroundings, with a good bank account, and looks at his whole life work as a magnificent entertainment.

The second fiddler, with which the world seems abundantly supplied, plays for his supper (generally the second table), and picks up such odd jobs as he can get a pittance for doing, lives in a hovel, wears poor clothes, and sees disappointment and gloom everywhere.

Young man, do you see a moral in this comparison? Look around you and see how many "second fiddlers" there are in the berry business in your community. Ask your grocer who is growing strictly fancy fruit and you will be surprised at his answers.

Do you not see an opening for a neat, clean and profitable business? Don't be a wage earner all your life, but get the best piece of land you can and stock it with thoroughbred plants and pitch in. Don't play second fiddle.

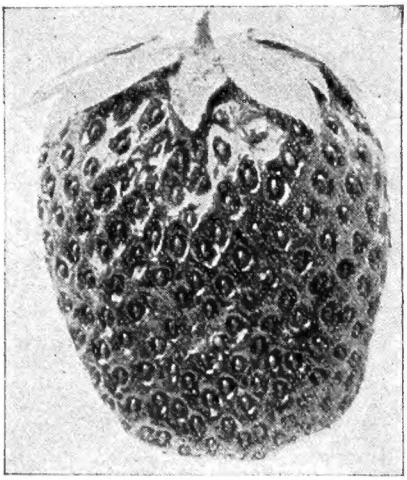


BRANDYWINE.

If there is anything you don't understand write me full particulars and my experience is at your service. It affords me a world of pleasure to give pointers and boost a young man into place as the "first fiddler" in the berry business.

THE POOR MAN.

The very poor man is poor because he surrounds himself with a poor home, on poor soil, uses poor tools, poor seeds, poor plants, gives poor cultivation and always has a poor crop of



HAVERLAND.

poor fruit and sells to poor people who are contented to buy poor stuff if it's "cheap" and thus he remains always and eternally poor.

THE RICH MAN

gets rich because he gets the best soil, uses the best tools, sets the best plants which produces

the best fruit and sells to the best people who will pay the best prices to get the best things. His customers are not slow to learn that he can be relied upon to furnish the best in the market and know they must pay him the highest price to secure his products. He becomes rich by getting a large profit on everything he touches and employs labor enough to do everything at the right time and in the right way and is always ahead with his work.

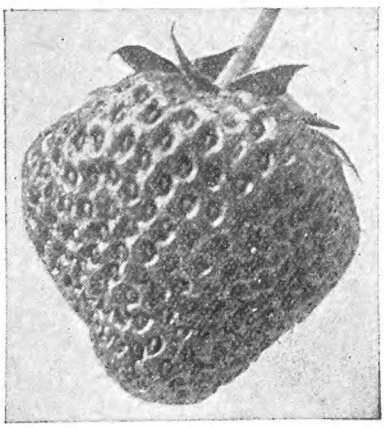
PROFITS OF FRUIT GROWING.

The profits depend on the grade of fruit you grow. I always expect to get enough more for my fruit than the general market price to pay the entire cost of growing it.

Do not lose sight of the fact that the average grower uses mongrel plants and gives the most indifferent cultivation. I can rent land and do all the work and get this high grade of fruit ready to pick on an average of less than one cent per quart. A crop of 300 bushels gives (at one cent per quart) $96 for expenses, so you can readily see that intensive fruit growing alone pays, to say nothing of ready sales. I am sure the time I save on the market covers all the extra work I do in growing the berries.

Don't try to lift the whole world at once, but only as much of it as will afford you profit and pleasure. Don't imagine you must have all the fancy tools to start with; you will be able to get them later. Any good farm tools will answer the purpose. Don't set any more plants than you can manure the ground for and cultivate thoroughly.

If your ground is not in shape send in a small order for such varieties as you desire and propagate your own plants for next year. Of course you lose a year's time in doing this but you must not do



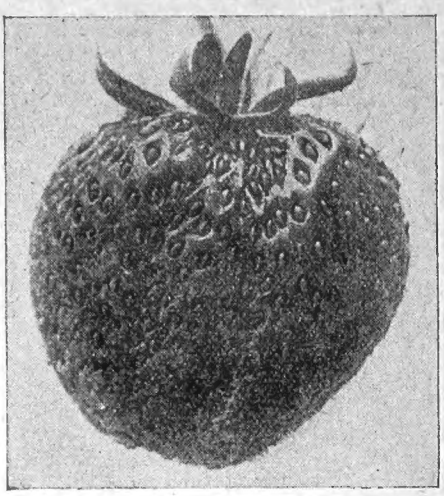
BRUNETTE.

things in a slipshod way if you intend to make a success of it.

FALL SETTING OF PLANTS.

We do not sell plants for fall setting at the north. The value of Pedigree Plants lies in their potency of pollen and fruiting power.

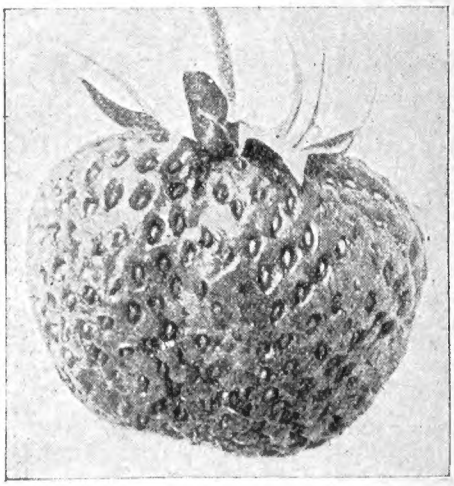
I have expended years of time in breeding up these plants and to send them out late in



ENHANCE.

the summer and fall, giving them only a few weeks of dry cool weather in which to become established, and supply themselves with rootage and fruit buds, is disappointing to planters and an injury to my reputation as a propagator of fine thoroughbred stock.

If you design to set plants for commercial purposes, let me admonish you there is no money in slipshod methods. Manure your ground during the winter, set your plants in the spring, remove blossoms and give thorough culture all summer and get immense plants,



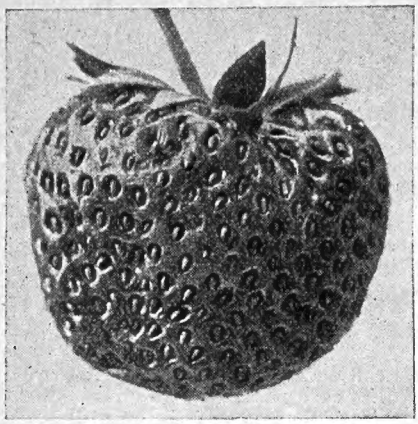
GREENVILLE.

which the following year will give you a grade of fruit that will enable you to dictate prices and control the market.

THE FRUIT GARDEN.

I pity the wife and mother of a family who has to prepare 1095 meals every year with resources limited to the pork barrel, potato bin, and bread tray. If she could only step into a

fruit garden and find an abundance of asparagus for April and May, delicious strawberries for the next month, and then raspberries, blackberries and grapes in succession until

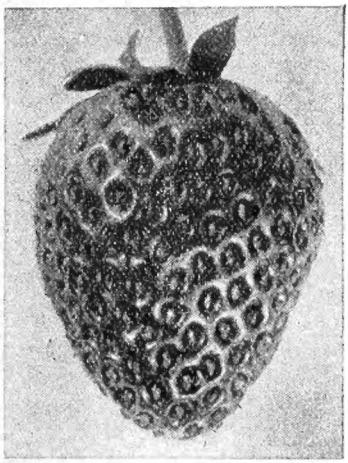


AROMA.

frost comes, giving a feast all summer long, with canned fruits in abundance for the long winter months, the whole question of what to get for a meal would be solved.

The way to the husband's affections and that of the children is right down through the stomach. Fruit eaters are always good natured. A fruit diet during hot weather means a clear head and strong body. The rich fruit acids cool the blood and are the great panacea for aches, pains and the "blues." It saves "family jars," doctors' bills, and enables a person to accomplish more work. It will keep the boys and girls contented at home.

They see all these nice things in the town and forget they are the products of the farm. Nothing adds so much to home life as a fruit garden.



LOVETT.

A small plat of ground, a few strong fruiting Pedigree Plants of early medium and late varieties, a little delightful recreation in the cool of the evening in caring for them and the pleasure is yours. To enjoy them you must see them growing. To see the great beauties begin to turn red and peep out from under the foliage so coquettishly is a great treat.

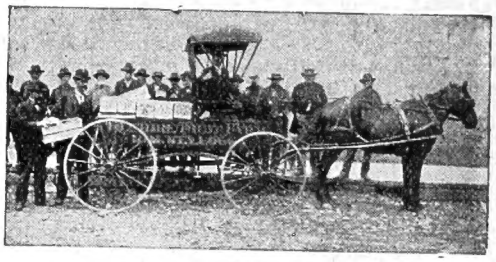
"Buy them cheaper?" Let us see about that. You furnish the land and manure and I can buy the plants and do all the work, paying regular wages and have all the berries ready to pick for much less than one cent per quart throughout the season. They will be at your door. No going without because you have no time to go after them. No expense for boxes except what the children need to pick and take to town to buy their school books with.

A berry garden will furnish the family more real luxury than you can buy with several acres of wheat. Give it a start this spring.

Farm for sale. The way to sell a farm is to make the would be purchaser feel that he would like to own it. A display of fruits will contribute more to that end than any other one thing. The cost is trifling compared with inducements to purchase.

BEAUTIFUL BERRIES.

The most beautiful berries are true to type, above medium and all of the same size. That is the advantage of Pedigree Plants. Their vigor enables them to bring their berries to the full size of their variety. Some excessively large berries are needed for advertising purposes to get people to talking about you, but the average family prefer above medium in size, good texture, rich flavor, hence the successful grower plants most largely of the medium sized varieties, and then gives careful culture to make them all grow large. These are the money-makers.



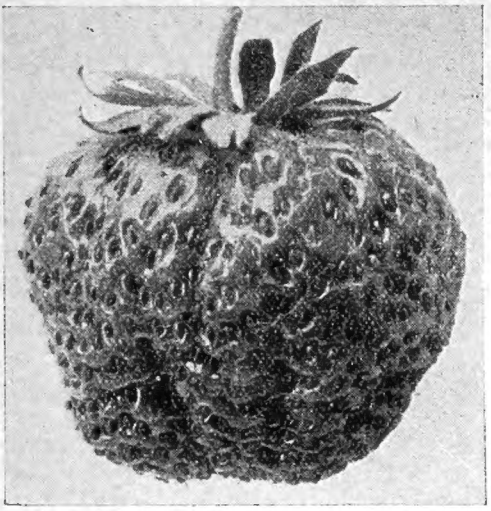
HOW TO SELL FRUIT.

I never give the market a thought until the berries are ready. I prefer to spend my time growing such a grade of fruit that customers will wait for my coming. I don't have to run around and drum up trade.

If your fruit is right you will not have any trouble in arranging with the leading dealer to handle all you have. Get a neat circular letter printed describing your berries and have one left with every family who is a customer of your dealer, telling them where they can be had. Have notices put in the papers to the same effect. Our "squib" is generally one line: "To be happy eat Kellogg's berries," sold at "Wilson's." Put this in the paper in a dozen places. Of course it costs a little, but it sets everybody to thinking of you, and the extra price and ready sale meets all the bills, and you are ahead in the end. The mere fact that this will bring the dealer a large amount of extra trade will make him glad to pay you all there is in it to secure the agency.

Pack your fruit honestly in a nice clean box and don't forget to put some big berries in

the bottom. The people will find them and give you a good deal of credit. If you ship to a distant city secure a reliable dealer in the same way and have a neat stencil or label

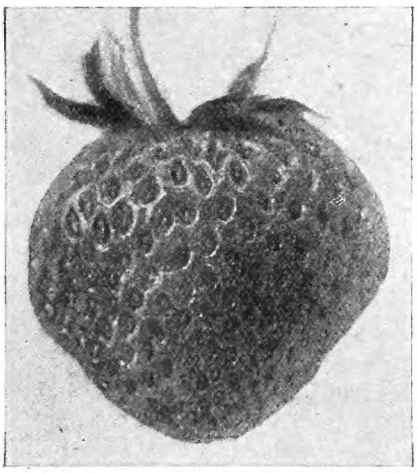


BUBACH.

which shall act as a trademark so that people will become accustomed to it and insist on having your brand.

You will have no occasion to make consignments to a commission house but will be put to your wits' end to get enough fruit to supply regular customers.

If you are so unfortunate as to have common fruit, do as the other fellow does; sell it for what it will bring but never put your name on it so that people shall find out that it came from your establishment. A good reputation is a splendid stock in trade. It gives you the advantage on the market and causes



CUMBERLAND.

the people to pass by the other growers and patronize you.

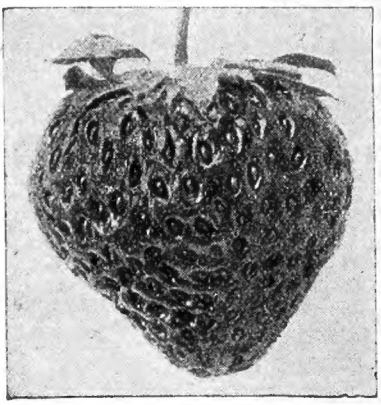
Have a neat letter head and bill head to use when you have occasion to write a customer or present a bill. Take pride in your business and do business in a business-like way.

SELL DIRECT TO FAMILIES.

I have made most money selling direct to private families. I never fail to secure for customers nearly every family on all the principal streets. Other growers would tag around after me and offer my customers their berries for two or three cents less per quart but I paid no attention to them.

Always insist on a fair price and back it up by a comparison of values and you will have no trouble in getting and holding customers. Be firm and courteous under all circumstances; don't get angry, if they do quit you, but express your regrets and leave them in a mood in which they can come back without prejudice. It costs nothing and it is pleasant to be known as a gentleman with whom everybody likes to deal. Don't cut prices, but look up new customers if you have a surplus of fruit. Don't peddle indiscriminately from house to house but have regular customers whom you supply daily.

Furnish each family with a ticket printed on manilla card board, about three inches wide and eight inches long, to be hung in a convenient place by the kitchen door where it can be found without delay. This prevents all bickering and dispute about price of berries pur-



GANDY.

chased. It saves making change and loss of sales because ladies do not always have change. It suits the "man of the house" because it furnishes vouchers as to correctness of bill. The family will buy double the fruit when this ticket is used and it assists in holding the customer. Insist on pay every week except when bill is to be presented at the store or office of customer at close of season.

The following is the form of the ticket:

DON'T FORGET TO BRING THIS CARD.

TIME IS PRECIOUS.

When you hear our bell ring, kindly HAVE THIS CARD READY AND BE AT THE DOOR, so we can make the proper entry and deliver the fruit with as little delay as possible. Payment expected every Monday.

M_____

In Account with R. M. KELLOGG.

Date.	Quarts Wanted.	KIND.	Dr.	Cr.

The word goes from one family to another and to their friends in distant towns, where families will club together and have several bushels shipped daily by express and divide them among themselves. I have always had a large trade of this kind.

When selling one kind of fruit, engage the next coming on, so as to have everything sold in advance. You will soon find all your time occupied in selling fruit and directing work, and you can hire the drudgery done by people of less enterprise.

Pay your men good wages, so they will prize their place, but let them understand that everything depends on first-class, careful work. When they see the drones being weeded out they will take the hint; and don't forget the worst use you can make of a man is to quarrel with him and call him hard names. Just say to him kindly that his services are no longer needed, and let him go.

A neat personal appearance is a good stock in trade. Wear a good business suit and keep your shoes blacked, and be in condition to approach a wealthy family and make a good impression, and never offer a customer berries in an old dirty box. Keep your wagon as neat and attractive as possible.

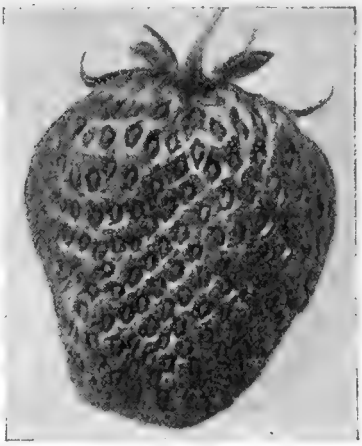
PHOTOGRAPH OF ONE DAY'S MAIL.

ANSWERING QUESTIONS.

I cordially invite correspondence with all fruit growers and will take pleasure in giving them the benefit of my experience whenever it will be of service to them. Answers will be by letter, and if of sufficient public interest the questions will be discussed through the columns of the Michigan Fruit Grower and Practical Farmer and marked copies sent to the parties making the inquiry.

My success depends on your success, and I am especially anxious that growers stocking their grounds with my Pedigree Plants shall do things at the right time and in the right way. To this end this paper will be sent free for thirteen weeks with every order for plants. You will find it the most valuable paper published.

Among the opportunities I have for keeping in touch with the most progressive fruit growers of the day, I may be permitted to mention that I have a complete up-to-date horticultural library, am a subscriber and a contributor to all leading horticultural papers, have long been identified with the Michigan State Horticultural Society and am at present a member of its executive board, and for several years secretary of the West Michigan Horticultural Society, which covers the most extensive fruit section in America. I am also an honorary member of five State Horticultural Societies, before which I have delivered lectures. I am regularly employed by the Michigan State Board of Agriculture to deliver lectures,



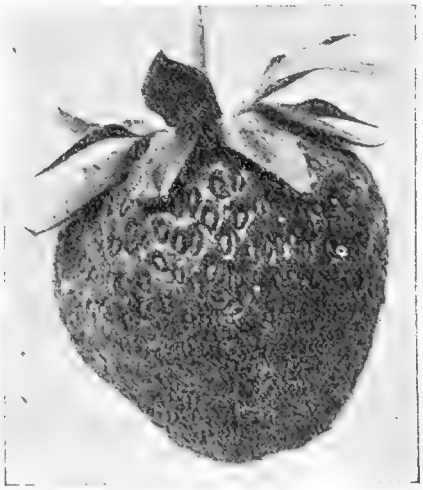
CRESCENT.

conduct institutes and lead discussions in fruit centers.

My large correspondence gives me practically an experiment station in every community in the country. They tell me of their methods of work, of the varieties they have tried and results obtained. With all these sources of reliable information I believe I can be of service to not only the commercial grower but to persons growing fruit for their own table. Write me at any time.

HOW PLANTS GROW.

About ninety-five per cent of the strawberry plant comes from the atmosphere and only about five per cent from the soil. There are

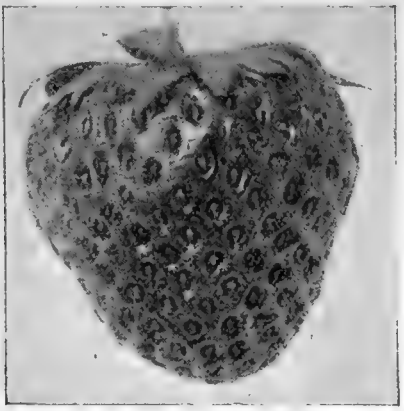


WOLVERTON.

about seventy ingredients of the soil which plants use, but they will get along nicely if only sixteen of these are present. All of these are in loamy soils in abundance except potash, phosphoric acid and nitrogen, which must be replenished by fertilizing.

Four-fifths of the atmosphere is pure nitrogen but plants cannot appropriate it until it is combined with something else to produce a nitrate.

After these minerals are dissolved in the soil



SUNNYSIDE.

water they are taken up by the roots and carried up through the center of the tree or plant to the leaves where they are combined with the carbon and other gasses of the air and digested.

The leaves perform the same office as the lungs and stomach of an animal. This sap then passes downward under the bark to form fruit and wood cells which constitute the growth of plant and fruit.

This work cannot go on without bright sunlight. A plant would starve to death with everything for food present if it stood in total darkness. It will make a feeble growth if only in moderate shade.

A series of careful experiments has shown strong fruit buds will not form in the shade, hence, when we allow runners of a strawberry plant to mat closely together and exclude the

THE WM. BELT.

light, we get a spindling or feeble growth. This weakens the plant and soon destroys the tendency to develop fruit. This is one of the causes why cheap matted plants have no value.

The strawberry plant droops its leaves naturally, so the sun can shine on the crown and all the foliage, and they should be kept far enough apart to permit the sun's rays to reach every leaf and bud, while growing in the propagating bed. All cheap plant growers mat them solid so the leaves shut the light from the crown and they lose their tendency to form fruit buds.

SELECTING A SITE.

I do not care to spend much time on this subject. Everybody knows good land when they see it. How would it do for a garden? Hard, flinty clay or light, drifting sand are bad. A light clay or sand loam are best. Stony land is good if it does not interfere with cultivation. Cold, springy land is bad. High land, that is, land which is higher than any in the immediate vicinity, is best. Cold air runs off the hills onto low land precisely the same as water, so that a low piece of ground with high land all around it should not be selected. Level land with no high hills near it will do. A south incline matures fruit early and a north incline makes the same variety later.

MANURING THE GROUND.

Stable manure is the best. I should prefer to have it well rotted, but that cannot always be had. Get the best you can find, even if you have to draw it as fast as made. Spread it evenly over the ground during the winter and early spring. Do not put in piles. The deep snow is no objection to spreading it. The winter and spring rains will wash the juices into the ground so it will be incorporated with the soil where the plants can use it. Before plowing rake off all coarse straw, so that capillary attraction which draws water from the lower subsoil shall not be cut off. Water will not pass up through a mass of straw if plowed under. **Be very careful about this.** If you can't get stable manure, apply broadcast from four to eight hundred pounds of pure, fine ground bone meal and not over fifty bushels per acre of unleached hardwood ashes and cultivate in before plowing.

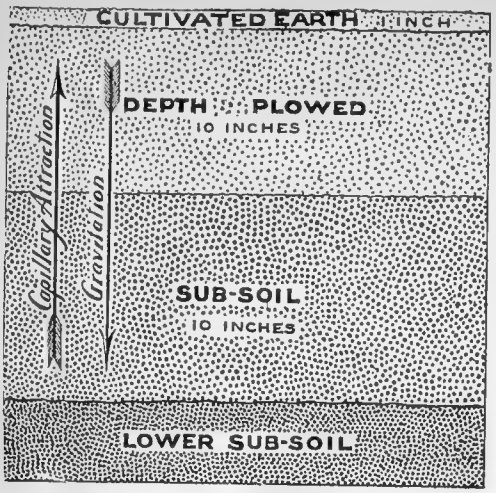
WHY WE PLOW AND SUBSOIL.

There are two reasons why we plow. If all plant food was soluble so the plants could use it at once, the rains would quickly wash it all out and the land become barren, and so to preserve it for the use of plants it becomes insoluble in water. At the same time a resolvent was provided which should make it available in small quantities so that the present needs of the growing plants could be supplied. This great resolvent is the oxygen of the atmosphere, and must come in contact with every particle of earth, before the plant can take up the food.

The lower subsoil contains an immense amount of plant food washed down into it where it becomes insoluble and remains there. By breaking up the subsoil we admit the air, dissolving this food, and the water returning to the surface by capillary attraction (see engraving) it is carried to the upper soil where the plant can use it.

Again we plow and subsoil because in so doing we separate the particles of earth so they will contain many times as much water as in their natural dense condition. In subsoiling we actually create a reservoir under the plant which will hold enough water in suspension

which can be conserved by surface cultivation to tide us over the most protracted drouth.



One inch cultivated soil so loose water will not rise by capillary attraction. Ten inches plowed and firmed so water will rise. Ten inches of reservoir in subsoil.

Water in the soil is moved by two forces. First by gravitation which draws the water down and second by capillary attraction (see engraving) which returns it to the surface again. Capillary means a hair-like tube or minute passage. If we enlarge the passage by separating the particles of earth too far apart it would take so much water to fill the space that this force would be overcome by gravitation and no water would rise. Thus when we plow and leave the ground very loose it soon dries out. Water cannot come up from below and free air finds its way through the openings and carries the water off.

So immediately after plowing, before the water has time to get away we go over it with a roller and press the particles of earth together so as to exclude this circulating air and make these passages so small that capillary attraction will bring the water up to the surface.

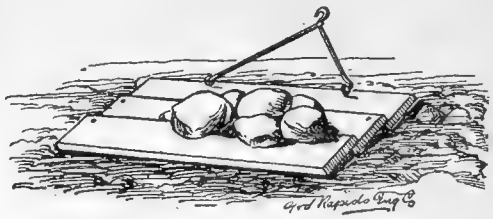
Why we cultivate. Now when the water comes up if it reaches the surface so as to come in contact with the bright sun it will readily pass off into the air. We want it to come within an inch or so of the surface of the ground so as to nourish all the roots of the plant. We take the fine tooth cultivator and separate the particles of earth, breaking up the capillary passages so that gravitation will not let the water come any higher and the loose earth and dust excludes the sun and wind so the water cannot get away, but will collect under this dust mulch for the use of the plants so that several inches of the upper earth will contain much more water than that a foot or so below it, and as this will cause the particles of earth to settle together again we must cultivate every few days.

The manner in which the water comes up through the ground might be illustrated by the wick of a lamp. The oil comes up the wick by capillary action precisely as the water does in the soil. We light the lamp and as fast as the oil comes up it is burned. Now blow the flame out and the oil comes to the top in such quantities that the wick holds all it can. The flame of the lamp carries off the oil just as the sun and wind does the water that comes clear to the surface. When we cultivate, it has the same effect as blowing out the light—it keeps the water below the surface or loose earth.

The crust forming after a rain excludes the air from the roots and makes capillary attraction perfect and should always be broken up as soon as ground is dry enough to cultivate.

The cultivator should only go deep enough to maintain the dust or loose earth mulch, rarely more than two inches are required and often one inch is better, depending on the texture of the soil.

The roller. You cannot properly fit land without a roller or floater. The plow and harrow leaves the ground too loose and does not sufficiently exclude free air, and capillary action will not bring the water up from below. The



A Floater.

particles of earth must be brought near together. If you do not have a roller, take three two-inch planks about seven feet long and one foot wide; bolt or spike the edges together like the siding on a house, and hitch a chain to each end and load it with as much stone as the team can draw, and go over the surface. On many soils it will do better work than a roller. **Do not attempt to set plants in loose earth.**

The Marker.

Marking off the ground. Have your ground properly firmed, leveled and rolled so the perfection plant setter will set the plants exactly the right depth, or if you use the dibble or spade you can determine quickly the right depth for setting plants. Mark as lightly as possible where the rows are to be. For this purpose we take a board about one-half inch thick, eight or ten inches wide and long enough to mark four rows at a time. Make four short sled runners and nail them under the board the distance the rows are to be apart, and nail shafts or handles on the top to draw it with. A man can draw it all day without fatigue. The object of using a thin board is to make it bend and accommodate itself to the uneven surface of the ground. Get the first row perfectly straight and let one runner go in the last mark as a guide. This will make all the rows exactly so far apart, so that late in the season when your plants get larger you can adjust the cultivator so as to do thorough work by going once in the row.

There are four methods of growing berries—

in hills or stools, the hedge row, half matted row, and full matted row.

HILL CULTURE.

This is the ideal way of growing strawberries. It might be designated as the process of consolidating many small plants into one large plant and many small berries into one large berry. By this method all the runners are cut throughout the season. Every time a runner is cut it throws the growth back to the mother plant and a new crown starts out on the side of the original plant, building it up to mammoth proportions.

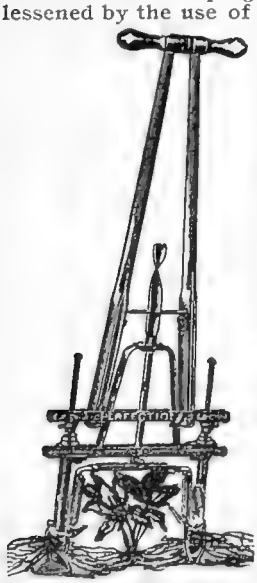
Plants on rich land, well cultivated, have often exceeded the size of a bushel basket, and produced over four quarts of immense berries of the highest quality. (See photograph on first page.)

When grown in hills, plants extend their roots down to a great depth and occupy all the ground between the rows, and sunlight comes to the crown and all parts of the foliage, causing perfect assimilation of the plant food and thus a continuous growth is maintained till the close of the season.

The requirements of hill culture are that the land must be very rich, and most thorough cultivation given, so that large crowns and foliage will be formed. I would not try to grow plants in hills on poor ground.

The fruiting vigor of the plants must be high as it does not pay to grow berries in this way with mongrel plants. Varieties making small foliage like Crescent, Warfield, Bederwood, Staples, etc., may be set twelve inches apart in the row, and the large varieties like Marshall, William Belt, Bubach, etc., about eighteen inches apart and rows as close together as you can cultivate in and gather fruit. About thirty inches is best, or you can set thirty by thirty and cultivate both ways. Runners may be kept off with a sharp hoe, the automatic runner cutter or the rolling wheel with very little labor.

The work of keeping off runners is greatly lessened by the use of the Automatic Runner Cutter and should always be used if hill culture is practiced.



Automatic Runner Cutter.

It is used as a walking cane, placed squarely over the plant and press down on the handle. The twisted shaft passes through the slot forcing around two fingers, each makits half circle gathering up all the runners and drawing them to each side of the machine when knives on each side are forced down cutting them off. When the machine is raised to pass to the next hill the fingers automatically fly back and it is ready to gather up the runners again. Very rough, stony ground would interfere with fingers, but in common ground it is a success. The price is $5.00 for single machine or both the plant setter and runner cutter at $8.00 if ordered together.

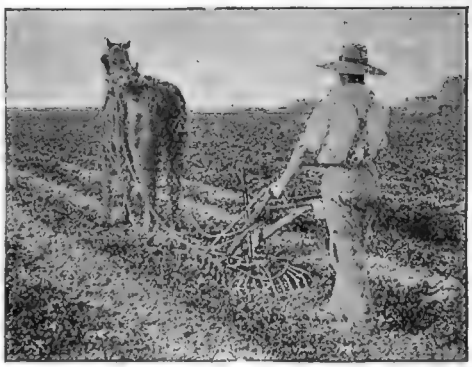
THE HEDGE ROW.

Set plants twenty to thirty inches apart, according to variety and fertilty of soil, and the rows as close together as they can be cultivated (about thirty inches). Cut the first runners to get the plants well established, then let the cultivator go the same way every time and close to the plant (not too deep), to throw the runners around so as to make the row perfectly straight and fill it so plants will stand six to eight inches apart.

Attach the rolling runner-cutter to clip the runners off as fast as they start. This is a ten-inch steel disk or wheel with sharp edge, which is mounted on an out-rigger and attached to the twelve-tooth Planet Jr. cultivator on the right side. It may be attached to any iron frame cultivator by having two small bolt holes drilled in the side bars. It has a castor action, and follows the cultivator easily, and is adjustable to depth of cut and side wise, and is provided with a leaf guard which is also adjustable. The guard lifts the leaves to avoid cutting them and the wheel cuts off the runners while cultivating is being done, thus involving no extra labor. Price of the cutter complete, $1.50.

The plants attain large size, being only one plant wide the sun reaches the crowns so they have perfect assimilation and the alleys afford abundant root pasturage. Almost the entire surface can be cultivated so as to conserve moisture and kill weeds; the fruit will be nearly as large as in hills and very even in size, and readily picked. The first cultivation can be done both ways if set in check rows. On any ordinary land this method is to be preferred to hill culture.

THE HALF MATTED ROW.



Half Matted Row.

This is the same as hedge row except that the rows are made about three and a-half feet apart and runners are allowed to set so as to form a row from ten to fifteen inches wide. After the rows form the rolling cutter is attached to the cultivator and other runners are kept off as in the case of the hedge row.

Plants should not be allowed to set nearer than eight to ten inches.

FULL MATTED ROW.

Probably three-fourths of all strawberries are grown in this way, but it is a mistake, and progressive growers are fast finding it out. It

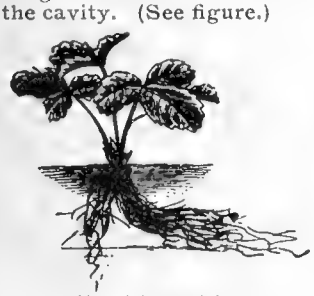
involves a large amount of labor in pulling out grass and weeds and fruit is always of a lower grade. Make rows four feet apart and set plants eighteen to twenty-four inches in the row. Let the cultivator go in the same direction every time, so as to throw runners around without tangling them and as they root narrow up the cultivator.

In the thick matted row there is not enough room for the roots, and plants forming later find it difficult to establish themselves; being supported with the "wire" from the mother plant they set buds and attempt to produce fruit which, for the want of rootage, they cannot bring to maturity. Thus they are not only worthless in themselves, but injure other plants near them. Careful growers thin out the plants when they get too thick.

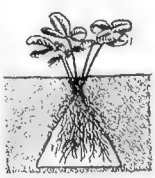
SETTING PLANTS.

The great point is to have all the roots straight and separated from each other and imbedded in soft mellow earth so that new feeding roots can start out in every direction without any hindrance and thus secure a vigorous growth at once.

The Spade is quite generally used, but in the hands of a careless man is about the most villainous tool ever used for the purpose. The first objection is that when forced into the ground, moved back and forth and sideways it makes a glazed surface and when closed by the foot in the ordinary way incases the roots in a veritable pocket and if dry weather follows the glazed surface will dry out and no feeding root can penetrate it. Dig a plant up a week afterwards and find the little white rootlets tracing up and down the old root to find a crack in this "plastered wall" through which it can penetrate to the mellow soil just beyond. No good growth can be had under such circumstances. If the ground be moderately loamy or clay the weight of a man will not close the bottom of the cavity. (See figure.)



THE WRONG WAY.



A "RAT HOME." (Bottom of hole not closed.)

Set a plant and step on it in the usual way and then dig down by the side of it and see how many "rat homes" you will find with roots hanging in free open air. You will be surprised to find that often more than half are exposed. Another objection is that the lower ends of roots are buried too deep. The roots of a plant spread out in all directions and coming near the surface feel the warmth of the sun and send out feeders much sooner. Notice the natural tendency in roots to run near the surface when taking them up in propagating bed.

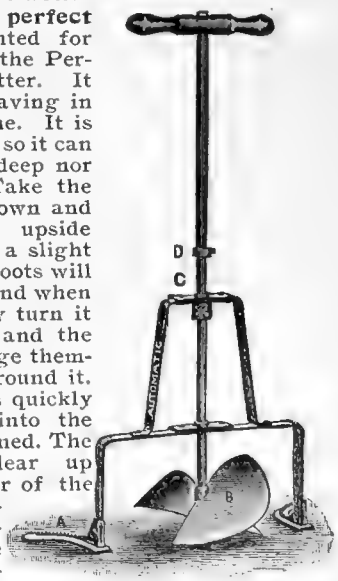
Use the spade this way. Let a man go ahead of the setter, force the spade straight down two-thirds the length of the blade, then draw the handle towards him about ten inches, force one inch deeper, push from him far enough to make the earth stay and withdraw the spade, thus leaving the opening so the bottom is easily closed. Quickly insert the hand rub off the glazed surface and take a few roots from one side of the plant, holding crown in left hand, deftly drag the roots sideways into the opening and when all spread out evenly and center of crown just even with surface of ground quickly fill the cavity, piling the earth so that when stepped on it will be perfectly level around the plant.

TOO DEEP.

TOO SHALLOW.

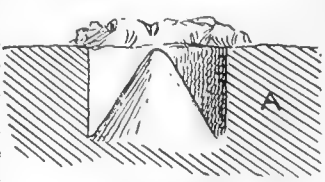
If the crowns are too low they will rot or make a feeble growth. If too high the upper roots will be exposed to wind and die. The new roots always start from above the old ones and if the plant is not in the ground deep enough they will not start. (See engravings.) If a little too deep new crowns will not start on the side of the plant, and if a little too high it will make only a feeble growth. I urge great care in doing this work.

The most perfect tool ever invented for this purpose is the Perfection plant setter. It digs the hole, leaving in the center a cone. It is set with a gauge so it can be neither too deep nor too shallow. Take the plant by the crown and hold the roots upside down, giving it a slight quick jerk and roots will fall over the hand when you can quickly turn it over the cone and the roots will arrange themselves evenly around it. Then the dirt is quickly brushed back into the opening and firmed. The cone comes clear up under the center of the crown, the bottom of cone being about five inches in diameter and roots so distributed there can be no tangled mass as it gives a circumference and immediate root pasturage of over fifteen inches.



PERFCTION PLANT SETTER.

The Perfection Plant Setter does the work faster than any other machine that will do it equally well. **The only requirements are** that the ground shall be properly fitted by rolling and reasonably

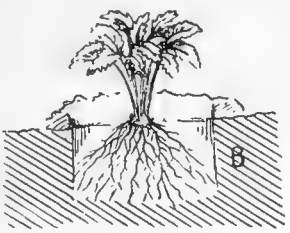


THE CONE. (Ready for the plant.)

free from sod, straw, or anything which would gather on the edges of the blades in quantity so as to tear the cone to pieces. Small stones do not interfere if not too many. Price of setter, $3.50.

Separating Roots.

An absolute necessity. I wish to impress the necessity of loosening the earth around the plant by cultivating *immediately* after plants are set, so that capillary action will bring the water up above the roots and collect under the loose earth or dust mulch and nourish the plant during the trying ordeal of transplanting and becoming established. Where you step around the plant to firm it about the roots you have left the particles so close together that the water

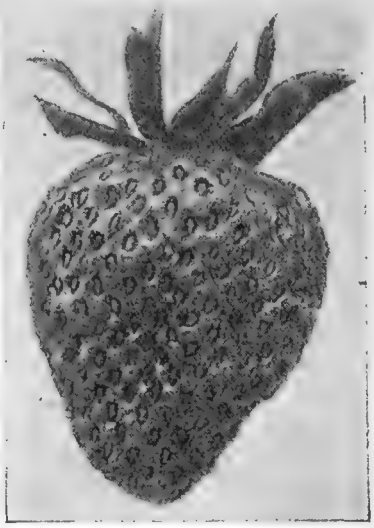


Ready for Covering.

Warfield.

draws up to surface with great rapidity to be carried off with sun and wind. I do not wait a single hour after plants are set before cultivating.

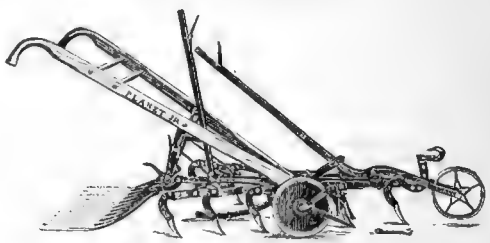
Leaving the ground without cultivation for a few days in a dry time kills and stunts more plants than any other negligence you are liable to commit. To have a boy drop plants ahead of the setter, often leaving them five minutes in bright sun and drying winds is sure death or permanent injury. Don't do it. Put a piece of manilla paper in the bottom of a basket and pour in a quart of water and then open the bunches of plants and set the roots in it and take them out as needed. Do not let them



Cyclone.

stand in water over a half hour before setting as they become soaked and injured.

CULTIVATORS.



Planet Jr. 12-Tooth Cultivator.

With pulverizer complete with runner cutter, $9.50; without runner cutter, $8.00; without pulverizer and leveler, $6.50; pulverizer alone, $1.75.

The Planet Jr. twelve-tooth cultivator and pulverizer, with the runner cutter attachment, is by far the best tool ever made to cultivate a strawberry bed with. It leaves the surface very fine and level. The teeth are so constructed that they lift the weeds out and destroy them, while the pulverizer attachment mashes up every lump and leaves the surface loose and fine, so that the capillary or water passages are destroyed, and evaporation prevented. It is instantly adjusted to any width or depth. The runner cutter is quickly put on or taken off. It is the only cultivator we use in our beds. We can furnish all the Planet Jr. garden tools and cultivators at manufacturers' prices. Send to us for special catalog of their goods.

The Z. Breed Weeder. We have received many complaints that this tool tore off the new roots of strawberries which come out above the old ones, and so many soils are not adapted to its use. It can only be used on strawberries in the hands of a very skilful man. It is all right on most other crops. Plants must be treated tenderly and for that reason we urge all to use the Planet Jr. twelve-tooth cultivator with pulverizer attachment.

WINTER PROTECTION.

In the case of strawberries it is not the freezing that does the injury. On many soils, especially clay, when the ground freezes all night and thaws the next day under the influence of the bright sun, the ground contracts and expands, and thus heaves the plants up, pulling the roots loose, which weakens them. Now if we place some coarse litter over the plants merely to shade them from the sun to prevent thawing during the day and the frost comes out very slowly, no injury can result.

The plant must have air for its foliage even if frozen solid, hence, any heavy, dense mass like manure will smother and injure it. The strong ammonia washing down from manure is very bad for the foliage and it should never be placed directly on the plants, but it may serve a good purpose in conserving moisture between the rows. Light chaff, straw or marsh hay may be used.

In the spring if the mulch has been applied between the rows heavily enough we rake off from directly over the plants to allow the leaves and stems to come up through the mulch, and leave it until after the picking is done. If the mulch has been applied only on the plants and none between the rows, we cultivate not over one inch deep and then rake part off to the edge of the row to keep the berries clean.

CARE OF THE OLD BED.

If an exhaustive crop has been produced, or the ground is full of grass so as to involve a great deal of hand labor, it might pay better to plow it under at the second or even after the first crop. If it is in reasonably good condition, a second or third crop will cost but very little and often give large profits.

Just as soon as the last picking is done mow off the top of the plants, not too close to the ground, but leave stems long enough to hold the rubbish up from the crowns; stir up the mulching, and if necessary apply more straw. After it gets as dry as possible, wait for a high wind so the fire will pass over rapidly, and burn up rust, fungi, weeds and all insects.

I wish to emphasize three things:

First. This burning must be done *immediately* after the picking season is over. The plants are now utterly exhausted. The old leaves and roots die, a spark of life remaining only in the crown. The plant remains in this dormant condition only a few days, when new leaves start and new roots come out above the old ones. The old foliage is an injury to the plant because it is often more or less affected with fungi and the spores are liable to go to the new leaves and should therefore be destroyed.

It must not be burned after this new growth starts, or the plants will be killed or greatly injured.

Second. A good, strong wind must prevail, to drive the fire over the ground rapidly, when there will be no danger of heating the crowns.

If there is an abundance of mulch, it is better not to mow the plants off. Put the mulch on the row so it will destroy all the old leaves.

Third. To cultivate the same day of the burning. The pickers tread the ground down hard making capillary attraction perfect so the water will draw up to the surface to be carried off by the wind and hot sun and the ground will soon dry out below the roots, and the plants will die.

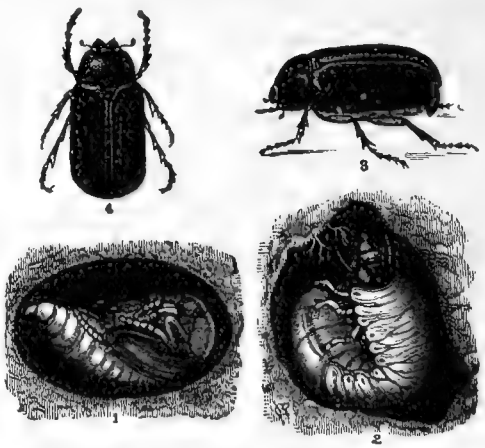
I have heard of plants being killed by burning but in every case some of these things have been neglected. We have burned over our beds every season for many years and never had a bed injured. In a few weeks the bed will look like a new spring set field. As all annual weeds are killed but very little hand work is required.

It is important to cultivate so as to throw about an inch of fine earth over the plants as the new roots come out above the old ones and the crown of the plant is raised up every year. This also acts as a mulch to conserve moisture.

When runners start put on the rolling runner cutter and clip them all off. This will cause new crowns to form on the old plant and send its roots down deeper. Cultivate after every rain until ground is frozen.

I have assumed that you were growing in hedge rows or hills. If you use the wide matted row narrow the bed up at first cultivation so as to be about ten inches wide and cut the weaker plants out leaving them ten inches apart.

INSECTS.

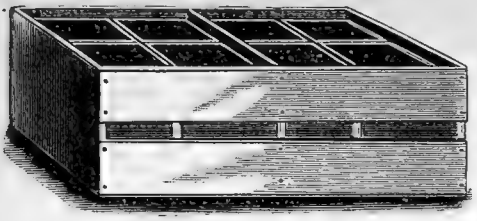


3 and 4, May beetle; 2, larva or white grub; 1, pupa.

The only insect likely to do serious damage in strawberries is the white grub or larvæ of the May beetle illustrated in the engraving. The larvæ feed on the roots of grass and are often found so thick in old June grass sod or pastures as to destroy it. They are passionately fond of strawberry roots and great care should be exercised not to set plants on ground infested with them. They remain in this larval state for two or three years, doing the most damage the second season.

Grubs similar to these are often found in manure and old wood, but that kind does not eat roots and is therefore harmless. As there are so many kinds it will be safer to send some of those found in your ground to the entomologist at your State Agricultural College and ascertain if they are the true May beetle. They can be sent by mail. They very rarely or never lay their eggs in fresh cultivated ground so that if the land has been in any hoed crop for two or three years previous there will be no danger. Examine old strawberry beds carefully before resetting.

BASKETS AND BERRY BOXES.



For many years past we have bought all our fruit packages of the Wells, Higman Co. of St. Joseph, Mich., and knowing them to be among the most extensive and reliable manufacturers in their line I take pleasure in recommending them to any one who may be in need of any berry boxes or other shipping packages. Their goods are strictly first-class, and fruit growers who are not acquainted with this firm should correspond with them. They will mail their illustrated catalogue free on application.

NEW SEEDLINGS.

In the past I have devoted my time to breeding up and increasing the value of old standard sorts by restriction and systematic selection of *Ideals* until they are exceptionally strong in breeding or fruiting powers and possess a robust constitution, and now, with other facilities as perfect as can be devised, I propose to inaugurate an extensive system of breeding seedlings with the hope of combining the good qualities of parents by systematic crossing, thereby eventually securing the ideal variety in both fruit and foliage.

Our facilities and experience with varieties are at the disposal of those who have discovered or originated new varieties free of charge. At least 25 plants should be sent for testing. Our trial grounds the coming year will contain over 200 distinct sorts.

Careful records are kept throughout the season and a definite report made of their behavior. Under no circumstances will they be propagated from for the sale of plants or allowed to leave the grounds without the consent of the owner. Plants for testing can usually be sent by mail.

VARIETIES OF STRAWBERRIES.

The great diversity of soils renders it exceedingly difficult to recommend varieties. Those which do well with me may not do well with you. If two varieties are set side by side, one fails, the other succeeds grandly; remove them both to another field and their success will be some times exactly reversed. It often happens that the same variety from another part of the country will do better; this has often been found true of the old standards, Crescent and Wilson. The only way you can determine definitely is to experiment with different varieties, bearing in mind that those sorts which do well over the greatest area of country will be the safest to plant largely, and that exhausted plants cannot be made to succeed anywhere.

I do not believe there is any soil on which large crops of corn and potatoes do nicely where some variety of the strawberry will not do equally well, and this can be definitely settled only by testing.

Set largely of those varieties which have been widely tested and found to succeed almost everywhere. There are many new varieties coming out and some are of the greatest value and may be exactly suited to your soil and location, in which case it would be a valuable discovery. Keep in mind that one crop of three hundred bushels per acre affords *a large profit*, while fifty bushels would not pay expenses. This difference often hangs on the variety and its adaptability alone.

In selecting varieties arrange to have every third row of those marked "B" (Bi-sexual) and the other two marked "P" or pistillate and which are designated for the same season, early, medium, or late. Those marked B may be set alone although I believe they fruit

BI-SEXUAL, OR MALE FLOWER.

PISTILLATE, OR FEMALE FLOWER.

better if about six rows of different kinds are set alternately in the same field so as to cross fertilize.

There is no strictly male flower. Such a variety would produce no fruit. The only reason we use the pistillates is they are much more productive and hardy.

The price given is the lowest at which we can furnish the plants at quantities stated, but customers may select six of any one variety at dozen rates, 50 at 100 and 500 at 1,000 rates. We have cut the price as low as we can possibly furnish them and pay the labor of growing pedigree plants. We advise buying not less than one dozen strawberry plants for testing.

VARIETIES OF STRAWBERRIES IN ALPHABETICAL ORDER.

Aroma (B). Season very late. Size much above medium, firm, beautiful red flesh, foliage vigorous. Now widely tested and a favorite. Holds its size well to close of the season. 20c per doz., 50c per 100 and $3.00 per 1,000.

Annie Laurie (B). Season medium. Berries above medium in size, quality good, quite firm, foliage not large but vigorous and very productive. 25c per doz., 60c per 100 and $3.50 per 1,000.

Bouncer (B). Season medium early. Very large and showy berries but does not seem to come up to expectations in many localities. 25c per doz., 60c per 100 and $3.50 per 1,000.

Bubach (P). Season medium late. Last year I was not able to catalog this grand old berry but this year I can furnish it with the finest pedigree and vigor. Berries are very large, bright crimson, and a fine show berry. On rather heavy land very productive. 20c per doz., 50c per 100 and $3.00 per 1,000.

Beverly (B). Season medium, strong foliage, large, deep glossy red berries, moderately firm, foliage good in all respects. 20c per doz., 50c per 100 and $3.00 per 1,000.

Bederwood (B). Very early and productive. On some soils its foliage sometimes rusts a little but it always brings its fruit through in fine shape. It is recognized as a standard sort for fertilizing all extra early pistillate sorts. Berries above medium size and bright red color. 20c per doz., 50c per 100 and $3.00 per 1,000.

Brandywine (B). Season medium to late. One of the grandest berries ever introduced. It's one of our favorites. If you do not have it by all means get it this season. It is one of the heaviest fruiters and a "catcher" on the market. Berries very large, deep blood red to center. Photograph gives the ideal type. One of the strongest pollenizers for medium late pistillate sorts. 25c per doz., 60c per 100 and $3.50 per 1,000.

Wm. Belt (B). Season quite early to very late. Berries very large, bright crimson, and very productive. Conceded to be one of the best of recent introduction. Now that the plants can be had at a reasonable price will be largely set. 25c per doz., 60c per 100 and $3.50 per 1,000.

Belle (B). Season late. Berries very large, broad, conical. Color, dark crimson, foliage very vigorous. A showy market berry. 25c per doz., 60c per 100 and $4.00 per 1,000.

Bert Seedling (B). Season early. Medium size, very firm, dark red to center. A good pollenizer for early pistillate sorts. 20c per doz., 50c per 100 and $3.00 per 1,000.

Banquet (B). Season medium early to late. Berries of the highest quality and more nearly resembles the wild berry in flavor than any other. It should be chosen where quality is the main requisite. Berries above medium, bright crimson and beautiful. 20c per doz., 50c per 100 and $3.00 per 1,000.

Brunette (B). Season medium early. A magnificent berry of the highest quality. Above medium size and all of the same size when well grown, last berries nearly as large as the first. Dark crimson and very productive. 20c per doz., 50c per 100 and $3.00 per 1,000.

Bismark (B). Season medium late. Seedling of Bubach, which it resembles, and one of the most productive large berries yet introduced. Colors all over at once and is very beautiful. The berry in the glass on third page represents it fairly well. Bright red, flesh fine grained, excellent quality, good shipper. 30c per doz., 75c per 100 and $5.00 per 1,000.

Bisel (P). Season quite early. Plant a good strong grower. Berries bright red, above medium size, moderately firm, very productive, rich flavor. 20c per doz., 50c per 100 and $3.00 per 1,000.

Clyde (B). Season medium. It has been many years since a berry has been introduced which created such a furor among growers as this. Its strong points may be enumerated as follows: enormously productive, berries large, cone shaped, as pretty as a top, bright crimson to the center, foliage light green color, free from any spot or rust and seems to succeed on all soils. By all means give this berry a trial. 25c per doz., 75c per 100 and $4.00 per 1,000.

Cobden Queen (P). Season quite early. I believe this has a brilliant future. It has not been widely tested, being introduced two years ago, but all who have tried it are very loud in its praise. A good shipper, bright red, high quality, foliage large and vigorous. 40c per doz., and $1.00 per 100.

Capt. Jack (B). Season quite early. Very vigorous and a strong pollenizer for early pistillate sorts. Popular in the west, where it is largely planted for shipping. Berries dark red, medium size and very productive. 20c per doz., 50c per 100 and $3.00 per 1,000.

Cumberland (B). Season medium early. Berries as true as a top, light crimson and very large. One of the most beautiful berries, and a great seller for near market. Mild, rich flavor. Many persons cannot eat a sour berry and will enjoy this. 20c per doz., 50c per 100 and $3.00 per 1,000.

Cyclone (B). Season very early. One of the best pollenizers for early pistillates. A good shipper, of good size, high quality, bright red, long heart shape. One of the most popular varieties. Its foliage is very vigorous and never rusts. I know of no early berry which is more productive. 20c per doz., 50c per 100 and $3.00 per 1,000.

Crescent (P). This berry has made more money for growers than any other ever introduced. When properly grown, above medium size, bright red, good quality and a good shipper. Many growers have fruited it to impotency, and laid it aside because it would not attain size. I have maintained its vigor, so that it often grows as large as Sharpless. It makes runners freely, and must be grown in hedge or half matted row for "big berries and lots of them." 20c per doz., 50c per 100 and $3.00 per 1,000.

Dayton (B). Season early. A fine, rich, bright red berry, above medium size. Foliage strong and good. An excellent home berry and for near market. 20c per doz., 50c per 100 and $3.00 per 1,000.

Drouth King (P). Season very early. Plant roots deeply and succeeds on light land and ships well. It will keep in fine shape five days. Very productive. Berries above medium, bright red and good quality. 40c per doz., $1.00 per 100.

The Dew (B). Season late. Very large, often irregular shape, but its great size sells it at sight. It should be grown in hills. Berries dark red to center and high quality. 25c per doz., 60c per 100, $3.50 per 1,000.

Enhance (B). Season late. One of the most productive bi-sexual berries grown. Berries very dark red, sometimes ribbed, very large and holds its size to last of season. Good pollenizer for late pistillates and succeeds everywhere. 20c per doz., 50c per 100, $3.00 per 1,000.

Epping (P). Season medium early. Berries quite large, even size, bright color and very productive. One of the best for home or market. Foliage very vigorous and succeeds generally. 20c per doz., 50c per 100, $3.00 per 1,000.

Eleanor (B). Season medium early, good size and productive. Here it has a good record. Berries medium size, bright red, firm and excellent quality. 20c per doz., 50c per 100 and $3.00 per 1,000.

Enormous (P). Season late. Foliage vigorous, berries large, bright red to center, and very productive for so large a berry. It does not succeed on light drouthy soil. 30c per doz., 75c per 100 and $5.00 per 1,000.

Edgar Queen (P). A large, medium late berry, resembling the Sharpless, but more hardy and reliable. Berries very large, deep red, sometimes green tips. Does best on heavy land. 20c per doz., 50c per 100 and $3.00 per 1,000.

Fountain (B). Season medium early. Berries large and handsome, very regular shape, bright red color and rich flavor. I urge a trial of this variety. It's one of the new berries and desirable for testing. 20c per doz., 50c per 100 and $3.00 per 1,000.

Greenville (P). Season quite late. Now in general cultivation and a great favorite. It's a rival of Bubach but succeeds better than that on sandy soil. Berries very large, bright crimson and very productive, a splendid berry for market. 20c per doz., 50c per 100 and $3.00 per 1,000.

Gandy (B). On good strong land it is the best extremely late berry. It is very productive when in full vigor and commands a big price when all other sorts are out of the market. Berries very large and fine, a good pollenizer for Sunnyside. 20c per doz., 50c per 100 and $3.00 per 1,000.

Glenn Mary (P). This berry has a few stamens, but should be treated as a pistillate. Season medium early. It has proved a great acquisition, and is sure to come into general cultivation. Berries very large, regular cone shape, dark red to center. It is very productive, has a long season, with large berries to the close. Its foliage is large and fine. 40c per doz., $1.00 per 100 and $6.00 per 1,000.

Haverland (P). Season medium early. This berry, when well propagated, holds its place as the most productive berry grown. When planted in hills or hedge the berries lay in windrows on each side of the row. While it is not classed as a firm berry, yet it has a tough skin and handles well for a near market. Its stems are not strong enough to hold the immense loads of berries up from the ground and must be mulched to protect them. Berries large and uniform, bright crimson. 20c per doz., 50c per 100 and $3.00 per 1,000.

Hoffman (B). An extra early berry and very popular on the low alluvial lands of Virginia. It is then shipped to all points of the north, arriving in prime shape. It is a bright red, long, conical, very firm and good. It does not succeed on dry, sandy soil. 20c per doz., 50c per 100 and $3.00 per 1,000.

Iowa Beauty (B). Season medium early. A beautiful berry, above medium size, bright red, moderately firm, good quality and productive. 20c per doz., 50c per 100 and $3.00 per 1,000.

Jewell (P). Season very late. Berries large, conical and as true as a top. Bright red, and productive when grown on rich, heavy soil. An entire failure on sand. 20c per doz., 50c per 100 and $3.00 per 1,000.

Jessie (B). Season medium early. A large, bright red berry, but fickle as to soil and location. My correspondents report some successes and many failures. There are other more reliable sorts for its season for most localities. 20c per doz., 50c per 100 and $3.00 per 1,000.

Jacunda Improved (B). Season early. A seedling and great improvement on the old Jacunda. Berries very large and fancy. Bright red, and of the best quality. A good pollenizer. Largely grown in the west. 20c per doz., 50c per 100 and $3.00 per 1,000.

Lady Thompson (B). Another extra early southern berry, largely grown for shipping to northern cities and making a famous record in northern sections as well. Berries are very large and firm, dark red and attractive in the box. 20c per doz., 50c per 100 and $3.00 per 1,000.

Lovett (B). Medium early. A great favorite with all who have fruited it. It stands high as a pollenizer for all medium early pistillates. Size above medium, quite firm, dark color and quality high. 20c per doz., 50c per 100 and $3.00 per 1,000.

Marshall (B). Season late. King of big berries (see photograph on third page). I have greatly improved vigor of foliage and increased size of fruit by my method of propagation and now believe it has no equal as an extremely large berry. Berries deep blood red to center. Flavor very much like the wild berry. Foliage large and vigorous. While it will not perhaps yield as many quarts to the acre as some medium sized berries, yet it is the best extra large berry. 25c per doz., 60c pe 100 and $4.00 per 1,000.

Michel's Early (B). The earliest berry grown and when free from exhaustion is very productive. It makes runners freely and in matted row sets so thickly light is excluded from the crowns so fruit buds do not form. Should be grown in hedge or hills. The past season it held the market ten days at a big price before other berries came in. Our plants have been carefully bred since its introduction and will meet expectations. Berries medium size, bright red and a good shipper. 20c per doz., 50c per 100 and $3.00 per 1,000.

Mexican Everbearing (B). Season early. Berries medium size, bright red, regular shape, bears a second crop in August and September. If season is favorable the fall crop is quite heavy. 30c per doz. and 75c per 100.

Manwell (B). Medium late. Two years ago I received a box of these berries. They were five days on the road and arrived in fine shape. Much above medium in size, slightly flattened, bright red to center, bright yellow seeds and of the richest quality. Mr. Manwell sent plants for trial and I was greatly pleased with productiveness and fine quality. I obtained his consent to propagate a few from one hill and can supply in limited quantity. 30c per doz., 75c per 100 and $4.00 per 1,000.

Michigan (B). Season very late. Another very large berry of recent introduction. Berries next to Marshall in size, bright red to center, rich flavor. It is so late and large that it enables the northern growers to ship south. 40c per doz., $1.00 per 100 and $6.00 per 1,000.

Magoon (B). Season very late. A year ago five cars of these berries arrived in Chicago from the state of Washington. They created a great sensation. They were very large and beautiful, bright red to center, and arrived apparently as fresh as when they left their home on the Pacific coast. We procured plants from the originator last spring and can furnish the genuine. 50c per doz. and $2.00 per 100.

Margarett (B). Season very late. This is a new variety of the greatest promise. I think I never saw a berry which combined as many good qualities. Its foliage is not only vigorous but strong and waxy and free from spot or rust. Its berries are very large and even shaped, blood red to center and every hill just loaded, quality the very best; there will be a great demand for plants wherever it is seen. 50c per doz., $2.00 per 100 and $15.00 per 1.000.

Mary (P). Season late. It has a few stamens but pollen is weak and it should be treated as a pistillate, extra large, not of the highest quality, but productive and showy, fails on light soil. 25c per doz., 60c per 100 and $3.50 per 1,000.

Middlefield (P). Season late. On strong, rich, moist land it is a success; on light land a failure. Berries quite large, round, cone shape,

and bright glossy red. Makes very few runners; moderately firm. 25c per doz., 60c per 100 and $3.50 per 1,000.

Mount Vernon (B). Season medium early, an old standard sort of much merit. Berries a little above medium size, quite regular in shape and very productive. 20c per doz., 50c per 100 and $3.00 per 1,000.

Meek's Early (B). Season very early. Berries above medium size, moderately firm, quality high, bright red color to center. Foliage strong, waxy and vigorous. 20c per doz., 50c per 100 and $3.00 per 1,000.

Oregon Everbearing (B). Season early. After the first crop it rests a few days, then sets fruit for the fall crop, which sometimes is quite heavy. It's nice to have a dish of strawberries in August and September. 30c per doz. and $1.00 per 100.

Parker Earle (B). Season late. Probably the most productive late bi-sexual berry grown. On light land it sets more fruit than it can mature. On rich, moist land under high culture, it succeeds well. Fruit large, good quality, dark glossy red. It makes very few runners. 25c per doz., 60c per 100 and $3.50 per 1,000.

Princeton Chief (P). Season medium late. A good berry, above medium size, dark red to center and firm. Foliage extra vigorous, and seems to do well on light soil. 20c per doz., 50c per 100 and $3.00 per 1,000.

Princess (P). Season medium early. A very desirable berry, above medium size, good quality and color. Very popular in the northwest, where it originated and is well known. 20c per doz., 50c per 100 and $3.00 per 1,000.

Robinson (B). Season medium early. Berries above medium size, bright red and quite firm and productive. Foliage vigorous and a favorite in many parts of the west. 20c per doz., 50c per 100 and $3.00 per 1,000.

Rio (B). Season early. Berries above medium and very even in size, bright red, giving them a beautiful appearance in the box. 20c per doz., 50c per 100 and $3.00 per 1,000.

Smith's Seedling (B). Season medium early. When properly grown it is productive of large, firm, high colored berries. It makes runners freely and is apt to mat too thickly. It is better grown in hedge or half matted row. 20c per doz., 50c per 100 and $3.00 per 1,000.

Staples (B). Season early. A seedling of the Warfield and much resembles it and is especially valuable as a pollenizer for that variety. As it is they can be picked together in the same crates. Deep blood red to the center. Medium, but very even in size. Its productiveness is great. A very valuable early shipping sort. There will be a great demand for it. 20c per doz., 50c per 100 and $3.00 per 1,000.

Sharpless (B). Season medium late. The old well-known big berry. It has a tender blossom and easily injured by spring frosts, but still a great favorite in many localities. Rather soft for a market berry. 20c per doz., 50c per 100 and $3.00 per 1,000.

Shuckless (B). Season medium early. It parts from the stem in picking, hence its name, and does not handle well for market but is fine for the garden. Berries quite large, pale red, vigorous and productive. 20c per doz., 50c per 100 and $3.00 per 1,000.

Sunnyside (P). Season very late. The most productive late berry yet introduced. Here it is simply immense and should be included in every order as an extra late berry. Use Gandy or Aroma for a pollenizer. A good firm shipper and will therefore be valuable where growers ship south. Berries large, bright red and attractive. 20c per doz., 50c per 100 and $3.00 per 1,000.

Splendid (B). Medium late. Above medium size, dark crimson, very productive and handles well. Foliage very vigorous. 20c per doz., 50c per 100 and $3.00 per 1,000.

Tennessee Prolific (B). Season early. A very large productive berry and good shipper. Very popular wherever grown, especially valuable for shipping north, succeeds well on sandy soil as it roots deeply, but does well on heavier land. Dark red to center, flavor excellent. 20c per doz., 50c per 100 and $3.00 per 1,000.

Tennyson (B). Season early. Another ever bearing sort. Produces many berries in Sept. and Oct. In a wet season the second crop is quite heavy, berries medium size, bright crimson and good. 30c per doz., and $1.00 per 100.

Tubbs (B). Season early. A new berry we offer for testing. Our plants came from introducer last spring. They show vigorous foliage and disposition to make large buds. Described large size and productive. 30c per doz. and $1.00 per 100.

Warfield (P). Very early, succeeds everywhere and with everybody. Ships well, sells well, bears an immense crop of dark berries, blood red to the center, and one of the very best for canning. The greatest market berry yet introduced. Should be grown in hedge rows when the berries are much above medium in size. I have bred this variety up until it is as near perfection in fruit and foliage as it is possible to be. 20c per doz., 50c per 100 and $3.00 per 1,000.

Wolverton (B). Season early. It commences to ripen early and makes a very long season. Its berries are quite large, bright red, quite firm and delicious flavor. 20c per doz., 50c per 100 and $3.00 per 1,000.

Wilson Albany (B). Season early. The old Wilson, which has done more to popularize berry growing than any other berry. By careless propagating it has run out and ceased to be a favorite in many localities. We still hold it as a great favorite and have bred it up so that it has its old time vigor. It does best on heavy, moist land. Its foliage has always failed on light sand. Grocers like to handle it and although medium size it is a great seller. 20c per doz., 50c per 100 and $3.00 per 1,000.

Wilson Improved (P). Season early, continues late. Foliage very vigorous and productive. Berries above medium, not quite so firm as its parent. 20c per doz., 50c per 100 and $3.00 per 1,000.

RASPBERRIES.

Sad havoc has been played with raspberries throughout the country. Not one grower in fifty is receiving one-half the net returns he ought to.

It has been an almost universal practice for growers to fruit plantations until run out and then propagate from these to start a new bed, which is in turn exhausted.

Pruning has often been deficient, so the plants have become pollen exhausted, and while the canes grow large they produce little fruit. The weakened canes succumb to fungi and insects, and after four or five crops the usefulness is ended.

Nurserymen have contributed to this condi-

THE EUREKA.
The King of Early Blackcaps.

tion of things by contracting for plants with parties who grow raspberries largely for evaporating. Size and flavor cut no figure, so bushes are allowed to bear every year all they will and are soon destroyed, and these plants are then sent broadcast over the country on account of the low price at which they can be offered.

The true way is to breed them up by propagating from young ideal canes in rapid succession, keeping them under restriction by close pruning, discarding weaklings and thus building up a potency of pollen and breeding stamina that is able to withstand unfavorable climatic conditions and give heavy returns for at least ten years. An occasional big crop does not accumulate money, nor does it give a command of the market. Start right, prune right, cultivate right, grow large, luscious berries, and all other things shall be added.

Planting. Rows should be at least seven feet apart and plants three feet apart in the row. Having fitted the ground as for strawberries, plow a furrow about five inches deep for blackcaps, set the plants flat in the furrow with roots spread out in every direction, taking the greatest care to get fresh earth in contact with all the roots and cover immediately.

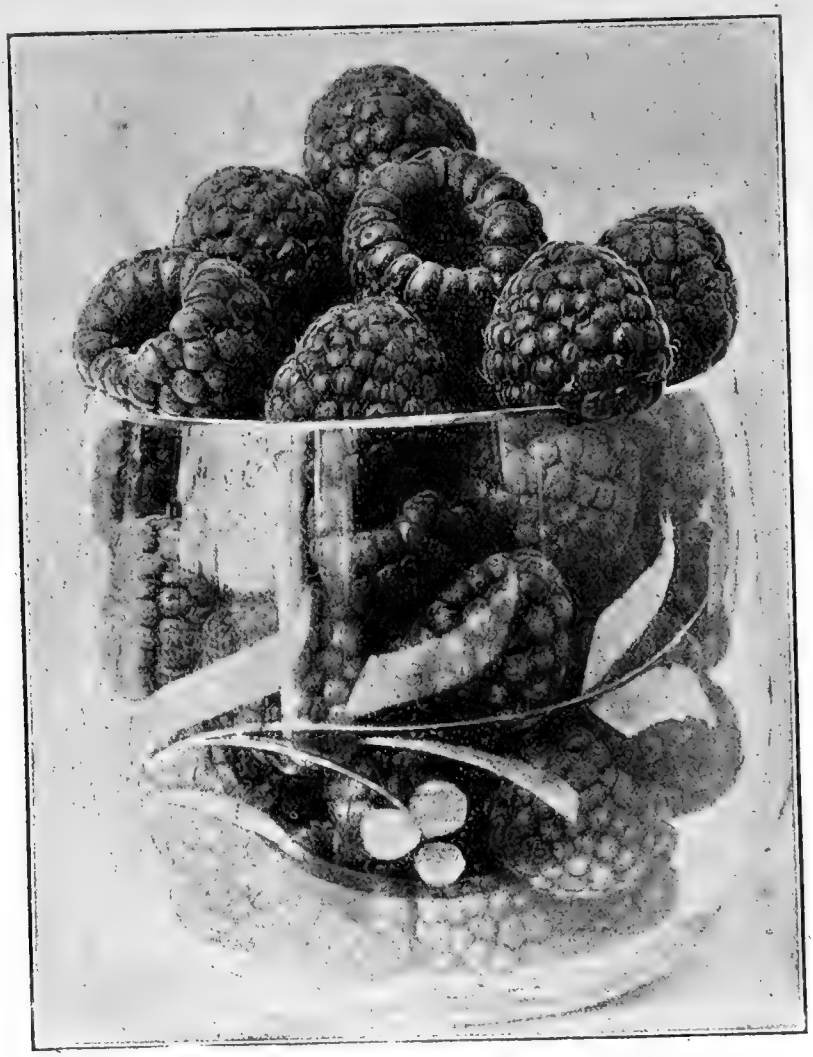
Cultivation should be thorough and frequent until the last berries are all picked, when the old wood should be cut out. It is the greatest blunder to stop cultivating in the driest part of the season, when the bushes are bringing their great loads of fruit to perfection. The feet of the pickers tramp the ground down hard and capillary action brings the water to the surface where it is carried off by wind and sun very rapidly. Let the cultivator go through them after every picking.

One of the neatest ways of growing raspberries is to string a wire about four feet high with a stake every forty feet, and tie the canes to this. The expense is not great, and it prevents the wind from threshing the berries off and gives clear space for cultivating. In this case I would not pinch them back, but let them grow in their natural way, and at winter pruning cut off the upper third, and this will leave enough buds to produce all the berries the bush can mature without exhaustion. I have come to regard pinching off terminal buds, when the plant is about eighteen inches high, a mistake. Checking natural growth at this time interferes with assimilation of plant food, and if the season is very dry and hot several days often intervene before new buds start.

But if ground is rich, canes get so long that cultivation is interfered with and pinching back might become a necessity if wire is not used. Great care should be exercised to remove only the terminal bud and not a leaf if it can be prevented. Never pinch in the laterals. One pinching of the main plant is enough. *Never* tie the canes to a stake in a bundle. They must have light and air and will not fruit without it.

Red Raspberries should be treated the same as blackcaps except no pinching should be done. Let them grow in their natural way.

The hardiness of raspberries as well as blackberries depends on securing a vigorous growth early in the season and keeping the ground moist by thorough cultivation during fruiting season. If they are allowed to dry up at fruit-



PHOTOGRAPH OF COLUMBIAN RASPBERRY, EXACT SIZE.

ng time they are sure to make a late growth nd likely to winter kill.

Set plants in spring in northern latitudes. In the south they may be set in the fall.

VARIETIES OF RASPBERRIES

Eureka made a great record again this year showing clearly that it is the most productive and best early blackcap yet introduced. The berries are nearly an inch in diameter, rich and sweet, yet black and firm enough to ship anywhere. The demand for plants last season was more than double the supply and will continue so until all growers have it. 50c per doz., $2.00 per 100 and $12.00 per 1,000.

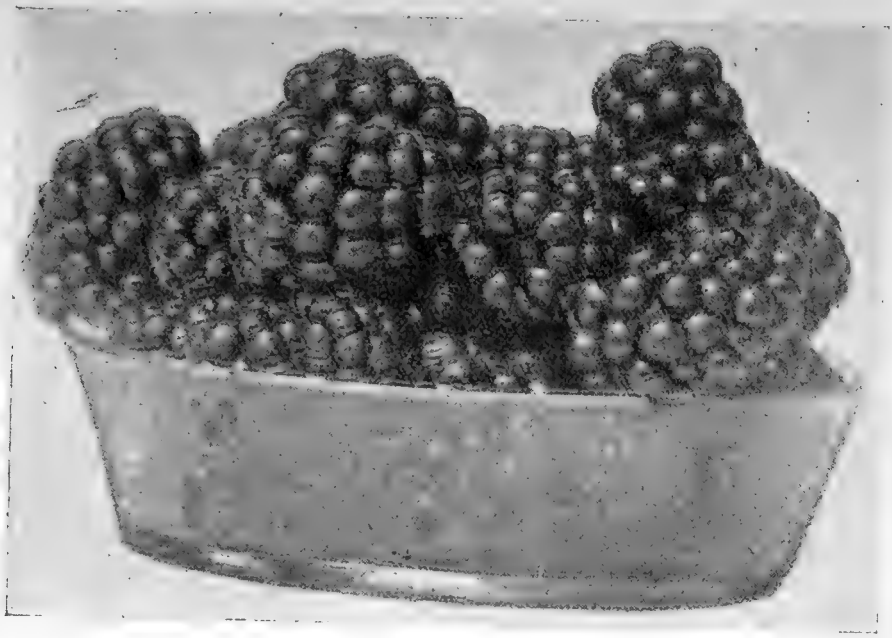
Conrath. This is now accepted as the best mid-season blackcap. It is as nearly iron-clad in hardiness as any berry under cultivation. Berries shiny black, small seeds, large size, very productive and especially good for evaporating. 30c per doz., $1.25 per 100 and $7.00 per 1,000.

Palmer. The earliest productive black cap. It ripens its fruit several days before strawberries are gone. Berries good size and showy, canes healthy and vigorous. 30c per doz., $1.00 per 100 and $6.00 per 1,000.

Columbian. I am more pleased with this grand berry than ever. No berry will produce more quarts to the acre, or sell better. Everybody likes them. It has a very rich vinous flavor and is very large. The color is purple, but has very little bloom and looks inviting in the box. It propagates readily from tips and you only need a few plants to get a start. 15c each, $1.00 per doz. and $6.00 per 100.

Gault. This is the most successful everbearing variety yet introduced. It bears a good crop at the regular season (quite early) and the tips of the new canes begin fruiting in August and continue until frost comes. Second crop is often larger than the first. It propagates from tips. 15c each, $1.00 per doz. and $6.00 per 100.

The Kansas. A large early berry, ripening soon after Palmer. It is very large and fine



THE WESTERN TRIUMPH BLACKBERRY.

Many experiment stations have placed it at the head of the list, all things considered. Its canes are very hardy. 30c per doz., $1.25 per 100 and $7.00 per 1,000.

The Older. Its good qualities are especially deep rootage so it succeeds nicely on dry soil and is of iron-clad hardiness. It has been widely set in the west and meets with much favor. 30c per doz., $1.25 per 100 and $7.00 per 1,000.

Shaffer's Colossal. A very large purple berry of much merit. Very productive and fine flavor. If it were not for the fruit bloom which gives it a dull color it would be a great success. It is fine for canning or the table. 30c per doz., $1.25 per 100 and $7.00 per 1,000.

Johnson's Sweet. This is the richest and sweetest blackcap grown. Ripens only two or three days later than Palmer. The berries are good size, very even and shiny black. 30c per doz., $1.25 per 100 and $7.00 per 1,000.

Gregg. The old standard big berry. We have not yet found anything better for its season. Its berries are often an inch in diameter when properly propagated and cultivated, very hardy and productive and firm, a fine shipper. 30c per doz., $1.25 per 100 and $7.00 per 1,000.

RED VARIETIES

The cultivation is the same as blackcaps except they should never be pinched back.

The buds are not so strong on the laterals, and do not produce as good berries as those on the main canes. By cutting off the upper third of the cane at the winter pruning all the buds will be left that are desirable. The plantation will last longer and fruit better. Treat all suckers as weeds. It soon spoils a fruiting bed to cut the roots in digging up plants.

The Miller. It came to us with the highest endorsements and has sustained them all. It begins to ripen more than a week before strawberries are gone and is the most productive extra early berry we have ever grown. The berries are large, bright red, beautiful in the box and an excellent shipper. 40c per doz., $1.50 per 100 and $10.00 per 1,000.

The Marlboro. This follows the Miller for medium season. On good land, very productive. Berries large, bright red, firm and a good shipper. 30c per doz., $1.25 per 100 and $7.00 per 1,000.

The Cuthbert. This has long been the standard late berry. Fruit is large, firm, bright crimson. It "stands up" well, and can be shipped any distance. 30c per doz., $1.25 per 100 and $7.00 per 1,000.

Golden Queen. A seedling or sport of the Cuthbert, and closely resembles it except the berries are yellow. It is fine for canning and near market. After they have been picked a short time they turn a dull color and do not sell so well. 30c per doz., $1.25 per 100 and $7.00 per 1,000.

The Loudon. Sure to become the leading late berry. Everybody is greatly pleased with it, and every plant obtainable will be set this spring. Its canes have proven very hardy; productive, berries very bright red and large, firm, and the best of shippers. 15c each, $1.00 per doz. and $5.00 per 100.

A REVOLUTION IN BLACKBERRY GROWING.

Nothing sells better, nothing pays better, nothing is grown more easily. The new method of starting the plantation produces double that of the old way. Its fruit is more luscious and a plantation will fruit heavily under good culture and pruning from fifteen to twenty years, giving annually large crops.

The demand for this fruit is practically unlimited. The trouble is blackberries as offered are sour, seedy and lack flavor.

Scarcely a town in the country is supplied at all with large, luscious blackberries.

Under the new system of establishing the patch every cane is loaded with large, luscious berries of the most delicious flavor and gives a big crop every year because the ground is filled with a dense mass of roots making root pasturage of every square inch of the soil for several feet around the plant, furnishing it an abundance of food to sustain it in bringing its great load of fruit to full maturity without exhausting the plant.

How it is done. Pursue the same method explained in breeding up strawberries. Find all the ideal canes bearing the finest fruit, and not over two years old. Early in the fall dig them up and cut roots in pieces about three inches long and pack in boxes of clean, coarse, sharp sand and place in a cold cellar regulated with ice so the thermometer will stand at 35 degrees. An ordinary cellar will not do, for if allowed to get too warm the cuttings will commence to grow and all be spoiled. If allowed to freeze they will not callus and thus fail to emit sufficient roots.

What is a callus? It is a law of nature that when a root is cut or injured the plant will repair the damage by sending out new roots, but no new root will start until a callus is formed. Certain wood cells and a gristle-like substance must form, and out of this callus the roots start. The process requires time and goes on at a low temperature and the longer the root is kept in this dormant condition the more calluses there will be.

Roots prepared in October form calluses in great numbers before planting time the following May, when the cuttings are placed in nursery rows in rich, moist, sandy soil about three inches apart and one and a half deep. It is quite difficult to make them grow properly without irrigation. *If the roots get dry* they will fail. If buried too deep they damp off and die. Low spring or cold ground will not do. They must have frequent cultivation and not a weed allowed to grow among them. As soon as dormant in the fall, the plants are carefully taken up and roots trimmed to the proper length and again packed in coarse sharp sand so it is solid around every root and kept as in the first winter, when calluses form all along the sides and ends of roots so that when planted out where they are to fruit in the spring myriads of roots will start at one time and at the end of the season the ground will be full of fine feeding roots as above described. In keeping them in the callusing cellar it should be supplied with ice, for if perchance the cellar gets too warm the plants will grow and be lost. We are thus able to send them to customers while dormant and early in the spring.

The common way is, as in the case of raspberries, to let a patch fruit as long as it will and then mow off the tops and let suckers come up from between the rows and the next season dig them up and start a new patch. Of course the weakness and exhaustion of the old patch is carried into the new. The roots on the plant are few and commence growing always from the end, and I have seen them extend several rods away, while near the canes the ground would not be occupied at all. The sap having to come through these long roots to the leaves for assimilation they are continuously sending up suckers which become a nuisance.

Digging sucker plants destroys a plantation very quickly and causes the sucker nuisance to increase.

In cutting the roots, depriving the plant of its feeders when soon to be loaded with fruit, exhausts and renders it unfruitful. Treat all suckers as weeds and cut them off a little under the surface.

The location should not be on low or marshy ground. High land is better.

Hardiness of blackberries depends on getting a vigorous growth early in the spring and maintaining it all summer. Many growers stop the cultivator before berry picking begins. The ground is packed by the feet of the pickers; the water passes out and the berries dry up; growth stops and buds form as if for winter. Later the fall rains come and these buds which should have formed late in the fall start to grow and do not mature before winter sets in, so it only requires a moderate freeze to kill these "sappy" half-ripened canes.

The enemy of blackberry growing is the summer drouth. All this can be managed with entire success. As soon as the ground is dry enough in the spring start the Planet Jr. horse hoe, cultivate every five days unless it rains, but cultivate immediately after the rain or as soon as dry enough and always after every picking the same day.

Keep a fine dust mulch on the ground all the time till the first of August and later if there is not an abundance of rain. The wood will ripen all right and as solid as an oak plank if you do not let growth stop during the great strain of maturing the crop. Never let the cultivator go deep enough to touch the roots but keep it going all summer. If any one tells you there is no need of so much cultivating and that a re-callused root cutting plant is not worth twenty times as much as a sucker plant, tell them for me they know nothing about great crops of blackberries and how to grow them. Do not pick oftener than twice per week. The berries should have been black at least two days before picking, then they are very sweet. A green berry is very sour. Let them get fully ripe.

VARIETIES OF BLACKBERRIES.

We are able to furnish two-year blackberry plants, which are fully three times the size of ordinary root-cutting plants, and will produce the next year fully half of a large crop and second year be in full bearing.

All the plants here offered are large root-cutting plants, re-callused, and under good treatment will produce double the fruit every year of those grown from common plants. The callusing process is a great triumph in blackberry culture.

The Western Triumph. On my farm at Ionia it has been the leading berry for nineteen years, and has never failed to yield a large and profitable crop. I have never given it winter protection, and have never known of a failure if properly cultivated. It is of good size, free from core and has a delicious flavor. Season early. One-year plants, 40c per doz., $1.50 per 100 and $9.00 per 1,000. Two-year transplants, very large and fine, 50c per doz., $2.00 per 100 and $12.00 per 1,000.

Taylor Prolific. Follows the Western Triumph in season. It is regarded as very hardy. In quality it is probably the richest berry grown, having that sweet aromatic flavor pecu-

liar to wild berries. It prolongs the season to the early grapes. One-year, 40c per doz., $1.50 per 100 and $9.00 per 1,000. Two-year, 50c per doz., $2.00 per 100 and $12.00 per 1,000.

Snyder—that old iron-clad, which succeeds anywhere a blackberry can be grown. If properly pruned and cultivated, the berries are of good size and fine. Like all other blackberries under neglect and not pruned, it overbears and berries are small. One-year, 40c per doz., $1.50 per 100 and $9.00 per 1,000. Two-year, 50c per doz., $2.00 per 100 and $12.00 per 1,000.

Ancient Briton. The leading berry in the northwest, where it grows to great perfection. Its canes and flexible roots render it easy to lay down for winter protection. Its berries are fine; season medium early. One-year, 50c per doz., $1.75 per 100 and $10.00 per 1,000. Two-year, 60c per doz., $2.25 per 100 and $12.00 per 1,000.

Eldorado. Comparatively a new berry, but has now been thoroughly tested and is meeting with much favor. The demand for plants will exceed the supply. Canes are strong and entirely hardy; berries good size, sweet and rich. One-year, 75c per doz. and $4.00 per 100.

The Rathburn. A new variety which propagates from the tips. While of the greatest value, apparently, I wish to fruit it further before sending out more plants.

Early Harvest. The earliest blackberry grown, ripening with first raspberries. The berries are not large, but so very even in size and beautiful they sell fast. It comes in long in advance of other varieties. It is not classed as hardy but its long slender growth makes it easily laid down for winter protection. One-year plants 40c per doz., $1.50 per 100, $9.00 per 1,000.

DEWBERRIES.

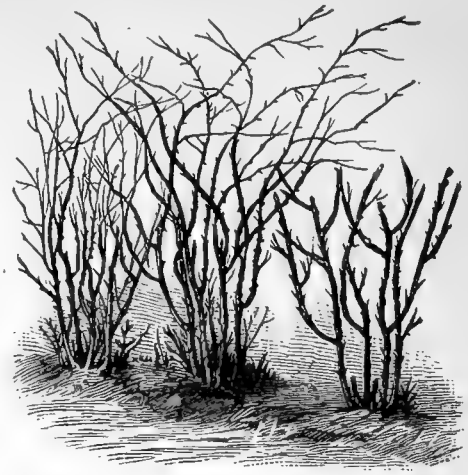
When properly grown the Dewberry is very profitable and a ready seller. It comes on the market two or three weeks ahead of the high bush blackberry and therefore always commands a high price. The better way is to put up a trellis of three No. 9 wires and prune in early spring and tie canes to these wires. Pick every other day or for table every third day. Give clean culture.

Lucretia. This is the leading variety and the most successful dewberry under cultivation, the Austin alone competing for its place. Berries very large, glossy black, often being found an inch and a half long and an inch in diameter. It ripens with the early harvest blackberry. 40c per doz., $1.50 per 100, $9.00 per 1,000.

Austin's Improved. This is a comparatively new berry of the greatest promise. Berries nearly two inches long and 1¼ in diameter, lustrous black and very productive. Ripens with the first raspberries. 75c per doz., $4.00 per 100.

PRUNING.

The object of pruning is to make plants more productive and to extend their time of usefulness. If left unrestricted they throw their whole energies into this one act of multiplying their species by seed bearing. While they should be encouraged to bear a large crop of fruit they must not be allowed to bear an excessive crop and so exhaust themselves that they cannot produce another large crop for several years, hence we must determine their ability and relieve them of surplus fruit buds maintaining an equal balance between root and branch, preserve symmetry and beauty and furnish light and free air to all parts of



the branches. We cannot cut off too much without seriously injuring the plant. The balance between the amount of roots and limbs must always remain equal. **The little fine rootlets** suck up the plant food in the form of water with a little mineral matter and pass it up through the middle of the stock by a force similar to capillary attraction until it reaches the leaves where it is digested and assimilated, the leaves performing the same office as the stomach and lungs of an animal. The digested sap now returns to the roots along under the bark where it builds up wood cells, enlarging the tree or bush and making the year's growth. Now, if we cut off an excessive amount of foliage, the roots take up the food and force it to the leaves in such quantities that assimilation cannot take place and a congested condition is brought on and all the effects of a gorged stomach of an animal are plainly seen.

During the fall months the bush stores up a large amount of plant food in the wood for use in the early spring before the ground is warm enough for the roots to act. We may prove this by heavy mulching when the ground is frozen so it will not thaw out until very late; the bush will begin to grow in the spring before the roots thaw out. The temperature of the air causes the buds to appropriate the stored food and they will make almost full foliage without calling on the roots for supplies, hence we can cut away a part of the branches and surplus fruit buds, and this early growth will compensate for it and maintain the balance between the roots and branches. The leaves having an abundance of light on all sides, assimilation is active and the roots being able to concentrate their powers on the fewer buds a very rapid growth is secured early in the spring, so the late summer and fall months are used to mature the wood and buds for the coming winter.

The removal of surplus buds while dormant prevents pollen exhaustion and thus enables the bush to impart a potency to pollen that secures full development of fruit, and large annual crops are thus grown.

Summer pruning. The best growers are discarding summer pruning. Unless an undue stimulus to leaf growth is given by rich nitrogenous manure, the more foliage we can have the better results will be obtained. With these suggestions the engraving will show how the work should be done.

CURRANTS.

They grow so easily, fruit so heavily, are so hardy and easily cared for that it is amazing that every table in the land is not abundantly supplied with this cooling and delicious summer fruit. The ground should be very rich and weeds and grass kept out. Cultivate frequently during dry weather to conserve moisture. Heavy mulching with manure or straw in the garden and small patches is good, but I prefer cultivation for field plants.

The Currant Worm appears soon after the leaves start, near the ground in a cluster. If a weak solution of Paris green is sprinkled on the lower center foliage that will be the end of them. If they appear later, dust a little white hellebore while the dew is on, or put a teaspoonful in a pailful of water and sprinkle with a whisk broom.

The London Market is by all odds the most profitable currant to grow. It sold for half more and produced almost double the fruit of any other variety. More will be set in Michigan this year than any other sort. The fruit is large, fire red, and clusters fine. 75c per doz. and $5.00 per 100.

Victoria has long been a favorite. Where the currant borer is known to be numerous this variety should be planted, the pith being so small that the worm cannot work in it to do serious injury. Fruit is good size, bright red and very productive. 60c per doz. and $4.00 per 100.

Fay. On very rich, heavy land and high culture it is fairly productive, and has very large berries. It does not sell better nor produce half as much as the London Market. $1.00 per doz. and $6.00 per 100.

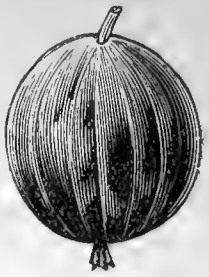
Cherry. The old standard currant, good size, good bunch and very productive. 60c per doz. and $4.00 per 100.

THE GOOSEBERRY

Is now attracting much attention and proving one of the most profitable berries grown. The demand is increasing very much faster than the supply. Their general cultivation is similar to that of currants, and insects are disposed of in the same way.

For picking use a thick pair of buckskin gloves and strip the fruit off by handfuls and run through a fanning mill, or pour them on a blanket so that the wind will blow the leaves out. It's quick work. Keep the bush pruned rather closely, and top of bush open. They do better with heavy mulch.

Smith's Improved is a large, pale yellow berry of great beauty and surprisingly productive. It is making many friends everywhere. I year, 15c each, $1.50 per doz. and $8.00 per 100. 2 year, 20c each, $2.00 per doz. and $9.00 per 100.

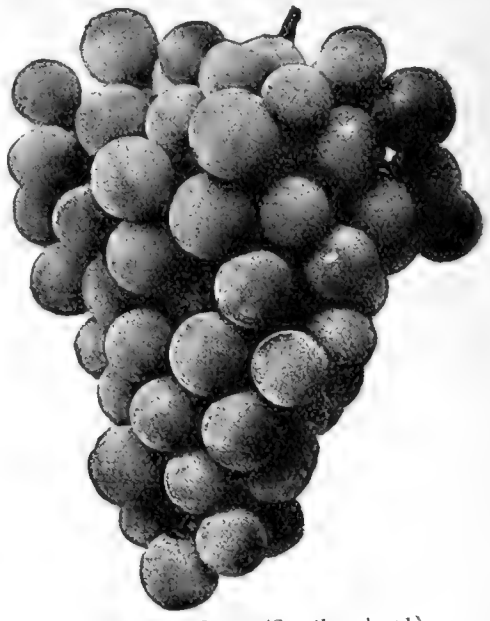


The Downing is the most popular berry for market, large, even, fine grained, and makes a fine large bush. 1 year, 10c each, $1.25 per doz. and $6.00 per 100. 2 year, 15c each, $1.50 per doz. and $8.00 per 100.

Houghton is enormously productive and very free from mildew. Berries are not quite so large as Downing, but in some markets sell better. 1 year, 10c each, 75c per doz. and $4.50 per 100. 2 year, 15c each, $1.25 per doz. and $6.00 per 100.

THE VINEYARD.

Of all the fruit that grows there is none more beautiful and tempting than the grape, with its great rich clusters hidden away in the cool shade of its dense foliage. They are so easy to grow and afford so much pleasure for the labor expended, that a **business man, mechanic or farmer** who should deny his family



THE EARLY OHIO. (Greatly reduced.)

or the hired help an abundance of this luscious fruit comes close to the borders of cruelty. A few vines, a very little care, and the enjoyment is yours.

The great point is to have cuttings taken from strong and vigorous vines that have always been kept properly pruned. We have already stated that cuttings taken from exhausted vines will not fruit as heavily as those from canes which have never been allowed to overbear.

The soil should be rather dry and neither the stiffest clay nor lightest sand. Good corn and potato land will do. It delights in warm sunshine for foliage and shade for its fruit.

Fertilizing should consist largely of ground bone and wood ashes, or *very thoroughly* rotted stable manure, which *must not* be brought in direct contact with the roots. Never use rank

unfermented manure under any circumstances. If the ground is in fair fertility, about three or four hundred pounds of bone and from twenty to fifty bushels of unleached wood ashes per acre will do the business. They should be cultivated in and thoroughly incorporated with the soil. I give a dressing of ashes every year. I am satisfied it gives a richer flavor to fruit and ripens the wood much better.

Preparing the ground. The ground should be plowed as deep and made as fine and mellow as possible. Some people dig holes two feet deep and four or five feet across, and fill them up with rich top soil to within a few inches of the top of the ground and then set the vine, and afterwards fill full. If the soil is porous or quite sandy, so the water will settle away quickly, this is precisely the *right* thing to do. But if you have a firm soil, a stiff clay, it is precisely the *wrong* thing to do; the water will soak into the soft earth and hold it there like a tub, and destroy the vigor of the vine. In the latter case break up the ground as deeply as possible and set the vine not too deep.

Never put any manure in the hill when setting. Manure seems to be rank poison to a young grape root. More vines die from this than from any other cause. *Don't do it.* Never mulch a grape vine. The soil should be warm where the roots are feeding.

The vines may grow as they please the first year, but the second year must be staked or trellised and pruned to three buds; after they start rub off all but the strongest one.

Pruning. There are a great many ways of doing this. Bear in mind that fruit grows on the present year's growth from canes of last year's growth. Very rarely a fruiting bud is found on an old cane.

The trellis. We prefer what is known as the *Kniffin system.* Two wires are used; the lower one not less than three and one-half feet from the ground, and the second fully two feet above the first. The vine is allowed four arms, each extending two to four feet out on each wire Then prune each lateral back to from one to three buds, leaving in all not more than from twenty to forty buds according to the vigor of the vine, and then the grapes should be thinned soon after the fruit sets, so as not to leave more than thirty to forty clusters. The clusters will be larger, of better flavor and ripen much earlier. A strong, healthy vine will always set more fruit than it can ripen, and the following year will be weaker, so that close pruning and thinning one year with another is the only way to secure continued large crops. If the vines are to be used for propagating they should not be allowed to bear over one-third the above in any year.

It is a great mistake to train the vine so low as to densely shade the ground. It invites mildew and rot. They delight in sunshine and plenty of dry air

Cultivate frequently and nearly up to the time the fruit begins to color.

VARIETIES OF GRAPES.

There are too many varities that are not especially valuable. We describe a few of those we regard as the cream of the list:

BLACK GRAPES.

It may be said that the introduction of the **Concord** was the beginning of successful grape culture in this country. It succeeds wherever a grape can be grown. It is yet the leading market variety and too well known to need description, but in many localities is giving way to the Worden. 10c each, 75c per doz. and $3.50 per 100. 2 year, 15c each, $1.00 per doz. and $5.00 per 100.

Worden, I believe, is the richest and sweetest black grape grown in this country. Perfectly hardy, fully as productive as Concord, larger berry and cluster, and a week or ten days earlier. They are gone before Concord arrives. 1 year, 10c each, 75c per doz. and $3.50 per 100. 2 year, 15c each, $1.00 per doz. and $5.00 per 100.

Moore's Early is one of the best extra early grapes, ripening fully two weeks ahead of Concord. The berry is very large, entirely hardy, and on rich soil very productive. It is generally all gone before Worden come on. Must have very heavy, strong, rich soil. 1 year, 10c each, 75c per doz. and $3.50 per 100. 2 year, 15c each, $1.00 per doz. and $5.00 per 100.

Talman (or **Champion**) is a prolific and profitable extra early market grape; ripens about the time of Moore's Early. Flesh sweet, juicy, and a rank grower. Healthy, hardy and vigorous. 1 year, 10c each, 75c per doz. and $3.50 per 100. 2 year, 15c each, $1.00 per doz. and $5.00 per 100.

The Early Ohio. The earliest good black grape known. It ripens fully ten days or two weeks before Moore's Early. Bunch large, compact and shouldered, berry medium size and covered with a rich bloom. Wherever tested has proven entirely hardy. Berries adhere firmly to the stem. 1 year, 25c each, $2.50 per doz. and $15.00 per 100. 2 year, 35c each, $3.50 per doz. and $25.00 per 100.

Wilder (Rogers' No. 4). Bunch and berry, large, early, hardy, healthy, and productive; good keeper, profitable, and of excellent quality. 1 year, 15c each, $1.00 per doz. and $5.00 per 100. 2 year, 20c each, $1.50 per doz. and $8.00 per 100.

The Hosford. This grape was discovered in a vineyard of Concords. It has all the hardiness, productiveness and vigor of that sterling old variety. The berries and clusters are fully double the size of the Concord, single berries often being found exceeding an inch and a quarter in diameter. 1 year, 25c each, $2.50 per doz. and $18.00 per 100. 2 year, 30c each, $3.00 per doz. and $25.00 per 100.

RED GRAPES.

Delaware. Considered by many as the standard of excellence in grapes, requires strong soil and good culture. 1 year, 15c each, $1.00 per doz. and $4.00 per 100. 2 year, 20c each, $1.50 per doz. and $6.00 per 100.

Diana. A little later than Concord, bunches medium and compact. Flavor peculiar, much liked by some and disliked by others. 1 year, 15c each, $1.50 per doz. and $5.00 per 100. 2 year, 20c each, $2.00 per doz. and $8.00 per 100.

Agawam. One of the longest keepers and best family grapes grown. Can be kept until March. 1 year, 15c each, $1.00 per doz. and $4.00 per 100. 2 year, 20c each, $1.50 per doz. and $6.00 per 100.

Jefferson. One of the best red grapes, a good grower, hardy and productive. Ripens with the Concord. 1 year, 15c each, $1.00 per doz. and $6.00 per 100. 2 year, 20c each, $1.50 per doz. and $10.00 per 100.

Lindley (Rogers' No. 9). Desirable for extensive planting. Strong grower, healthy

and hardy. Should be in every garden. 1 year, 15c each, $1.00 per doz. and $4.00 per 100. 2 year, 20c each, $1.50 per doz. and $6.00 per 100.

Moyer. Resembles Delaware in appearence, but is more vigorous and healthy. Hardy and productive. 1 year, 15c each. $1.50 per doz., and $7.00 per 100. 2 year, 20c each, $2.00 per doz., and $8.00 per 100.

Poughkeepsie Red. Much larger in bunch and berry than Delaware, but resembles it in color and taste; very early. 1 year, 15c each, $2.00 per doz. and $10.00 per 100. 2 year, 25c each, $2.50 per doz. and $15.00 per 100.

Salem (Roger's No. 22). Bunch and berry very large, Healthy, hardy and vigorous. A good keeper and fine table berry. 1 year, 15c each, $1.00 per doz. and $5.00 per 100. 2 year, 20c each, $1.50 per doz. and $7.00 per 100.

Brighton. Dark red; one of the most desirable of the new grapes; clusters very uniform and beautiful; quality fine. 1 year, 15c each, $1.00 per doz. and $4.00 per 100. 2 year, 20c each, $1.50 per doz. and $6.00 per 100.

Wyoming Red. One of the most hardy and beautiful very early red grapes grown. Skin rather tough, keeps well, fine flavor, vine very vigorous and hardy. 1 year, 15c each, $1.00 per doz. and $5.00 per 100. 2 year, 20c each, $1.50 per doz. and $7.00 per 100.

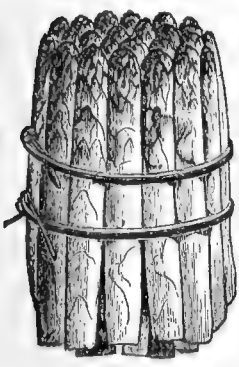
WHITE GRAPES.

Moore's Diamond. Bunch and berry very large; strong grower, hardy wherever grown, and becoming more popular every year. It has come to stay and will be largely planted and sought for in the market. 1 year, 20c each, $2.00 per doz. and $8.00 per 100. 2 year, 30c each, $3.00 per doz. and $10.00 per 100.

Niagara. Quality about like Concord; bunch and berry very large; vigorous, healthy and hardy. 1 year, 15c each, $1.00 per doz. and $4.00 per 100. 2 year, 20c each, $1.50 per doz. and $6.00 per 100.

In selecting varieties of grapes, as well as other fruits, have them begin with the earliest and extend to the latest, so the table or market may be supplied every day throughout the entire season. Always have an abundance of some one variety.

ASPARAGUS.



This is the greatest money making crop, labor considered, on the farm and will give a family more pleasure than anything else that can be placed in the garden. It sells at sight and people are just learning how delicious it is. Many prefer it to green peas. We have a half acre from which we generally cut about two hundred dollars' worth of "grass" every spring. We cut it every warm day from the last of April till the middle or last of June.

It grows from "crowns" and as quick as one shoot is cut another starts in its place so the growth is continuous. I have seen shoots as large as your thumb grow an inch per hour and we are often obliged to cut twice in a single day.

No family can eat as much as will grow from fifty or a hundred plants, and the bed will last more than one hundred years without renewal.

The plants are so cheap and trouble so little, every farmer should have a bed started at once. When the good wife is so bothered in April and May for "sass" she can step into the garden in a moment and gather a supply that in addition to a few other "fixings" will make a royal meal that will be greatly appreciated.

Select a site if possible sloping to the south and make it as rich as possible. Set rows three and a half feet apart and plants two feet apart in the row. Plow a furrow and set plants not less than six inches deep. Make no cuttings the first year. As quick as ground is dry enough in spring cultivate over the entire surface, taking care not to go deep enough to disturb the roots.

For family garden set a row along the fence or in a corner with plants about two feet apart.

Conover Colossal. More generally planted than any other. The old standard sort. 75 cents per 100, $3.00 per 1,000.

Barr's Mammoth. Very large on good soil. 80c per 100, $3.25 per 1,000.

Palmetto. Starts very early and largely used at the south for shipping north. $1.00 per 100, $3.50 per 1,000.

Columbian Mammoth White. Shoots clear white and very large. Commands an extra price in all markets. $1.00 per 100, $3.50 per 1,000.

MANAGING PICKERS.

Berry pickers will do their work very nicely if they are sure they will get caught if they do dirty work. Place a stake at the end of each row and number them consecutively. Make an alphabetical list of pickers and when they commence on a row the superintendent places the number of the stake opposite the picker's name, so if the picker gets away before the superintendent has a chance to inspect the work he can tell just who to look to if berries are not properly picked or foliage of plants is mussed or injured. Allow no berries to be picked which are not fully ripe and no ripe berries left on the vines to decay. Berries too small to sell should be picked to relieve the plant from maturing so many seeds, especially if plantation is to be carried over to next year.

Maintain a military discipline. Don't argue with pickers as to how the work should be done. Don't scold and fret at them, be kind but firm and give your orders clearly and positively.

Keep a blackboard in the packing house where all can see it daily. Place the name of each picker on it and grade their conduct when at work from one to ten, putting the figures opposite their names every day. This will make them sensitive about their standing and you will have very little trouble.

Make a positive rule that no talking shall be done in the field, only necessary questions about their work. A loud mouthed picker who is always finding fault is a nuisance and should be discharged at once. Adopt a regular system of fines ranging from one to ten cents and enforce it. This is much more effective and will prevent the offense being repeated. Never call to a picker in a loud voice and

attract the attention of all the others, but let the superintendent go to him quietly and set the example of silent work.

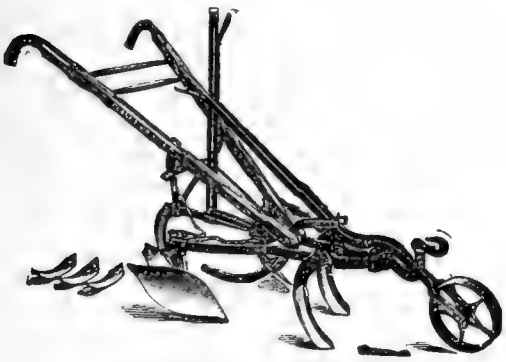
The best berries can be easily spoiled by bad picking. Teach them to pick the stem and not pull off the fruit so as to muss the berries. Put the big berries in the bottom of the box and fill the box up well and face them by turning the points of berries up on top, which makes them look very beautiful. It will be a pleasant surprise to your customers when they empty the box and find the big berries in the bottom, and they will tell it to their neighbors. A high reputation for honesty is the best capital in any business.

RUSHIRE
FRUIT FARM
PICKER'S CARD.
(Not Transferable.)
For.....

¼ qts.	¼ qts.		1 qt.	1 qt.

Use tickets to settle in the field or a conductor's punch and a ticket printed so you can punch out the number of quarts picked and pay pickers at the end of the week.

We pay one cent per quart for berries grown in hills and one and one-half cents for matted row, and at close of season for those who have remained all through we pay one-fourth cent per quart more. Reward your pickers by a picnic dinner at the lake or some distant grove where you can drive with wagons. They will greatly appreciate it and it will help you to secure the best pickers in the community.



THE PLANET JR. HORSE HOE.

The Planet Jr. horse hoe and cultivator. This is called a horse hoe because it does the work of a hand hoe so completely that the latter can be almost entirely dispensed with. It has such a "hang," that is, it handles so easily and is so quickly adjusted to width and depth as well as different work that a man soon becomes an expert and can put it in between the plants and do the work so skillfully and rapidly that it is a pleasure to work with it.

The pulverizer attachment so fines the surface, leaving it so loose and level, that the water is drawn up from the subsoil by capillary action and is stopped above the roots, where it is completely protected from sun and wind until the plants can drink it up and thus be enabled to maintain a steady growth during a protracted drouth. We can furnish at lowest manufacturer's prices their complete line of modern hand seed drills, garden cultivators and other tools. Send a postal card for special catalogues and prices of tools.

Price of horse hoe complete, without pulverizer, $8.00; with pulverizer attachment, $10.00.

CARE OF PLANTS.

Strawberries and other small fruit plants can be sent to any part of the globe with perfect safety. During the past spring we made large shipments to British Columbia, Nova Scotia and all the Pacific, Atlantic and Gulf States, as well as to New South Wales, Australia, a distance of 17,500 miles, the plants arriving in perfect condition.

They cannot be sold and handled with general nursery stock. The tree agent buys his trees in thousand lots where he can get them cheapest, often in different places and distant nurseries. They are brought together and unpacked and each customer's order made up and labeled, always in an open field.

The roots are always exposed for a considerable time in doing this work, and while the trees may endure such hardship, the plants are sure to perish or be so injured they cannot serve the planter and give him a full crop.

This is only one of the reasons why we do not sell any plants to persons selling general nursery stock or to tree peddlers. The other reason is so many "agents" are wholly irresponsible and use this pamphlet to get orders with and then deliver cheap exhausted plants.

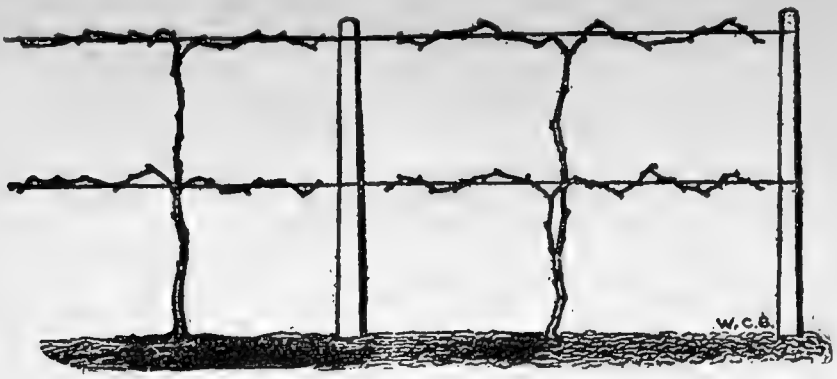
Please understand distinctly these plants cannot be bought of any agent.

We sell only direct to planters, and if purchasers will exercise the same care in handling the plants which we do in growing, digging, counting and packing them, they will not under reasonably favorable climatic conditions lose one plant in a thousand.

How cheap plants are dug and packed. Of course you do not expect a person will do work and lose money in doing it. He cannot grow, dig and pack the plants for less than he receives. The plants are dug by striking a rake into the row and pulling them out. They are then counted by boys and packed on the ground and both moss and roots exposed to the winds and sun all the time this work is being done.

Where the tooth of a rake strikes the crown it will not grow, no matter how perfect the roots may be, and each of these many mutilated plants makes a vacancy in your field.

We do it this way. Beginning at the end of the row, a long six-tined fork is forced into the soil below the roots in front of the plant so it does not touch any crown. The soil is lifted with the plant and dirt shaken out and *instantly* picked up and placed in a wet box with cover, so they are not exposed an instant. When the box is full it is carefully labeled and taken to a close room in a large building built expressly for the purpose and supplied with every convenience for doing perfect work. The leaves and stems are carefully removed and counted in bunches of 26 plants. The orders are so aggregated and given out to diggers that the different varieties come to the packing house at the same time, and the orders are carefully made up at once. No plants are exposed an instant or left over, but all packed by our



THE KNIFFIN SYSTEM OF PRUNING GRAPES.

trained men who have been with us from the beginning.

The perfection crate exposes leaves to the air while roots are imbedded in soft damp spagnam moss so they cannot dry out but grow right along on the road to their destination.

The purchaser can take them direct to the field and set at once. In this case pour cold water on the box and give it a good soaking just before opening it and exposing the roots to air.

If the ground is not ready they must not be left in the crates but thoroughly wet and every bunch opened and heeled in. Take a box and cover the bottom with sand or loam. Then take out a bunch and spread out thin and cover roots to the crown pressing the soil in so it will leave no open spaces in the roots. Add more plants and more soil and then set in the coldest place where there is light but no wind can strike them. They can be kept for weeks in this way. Keep soil only damp, not wet.

If weather is not freezing heel in on the north side of a building or under a tree. Follow the directions for setting plants, cultivate at once, remove blossom buds and runners as directed and next year please send me a report how they do. We have hundreds of these letters and testimonials which we should be glad to publish if space would permit and we shall be glad to add your portrait to our horticultural gallery and evidence of the real value of thoroughbred plants, and know of your success and prosperity.

ROLL CALL.

On the back cover will be seen our employes standing in rear of our residence answering to the noon day roll call. We love the boy but you notice none are present. They need too much watching. A lazy, careless man is never knowingly employed and promptly dismissed when found. These are all intelligent men, trained to do their assigned work exactly to rule They are paid good wages and all prize their places and thoroughly enjoy their work. They are divided for field work in gangs of four, with a foreman who is held responsible, and who places his number card in every box of plants he touches so we are able to trace any carelessness directly to him, so that great accuracy is secured and every man's work chimes in like the wheels of a clock.

A man who labels a plant wrong or makes a mistake foots the bill, so you can rest assured mistakes are few and far between.

NUMBER OF PLANTS REQUIRED TO SET ONE ACRE.

STRAWBERRIES.		GRAPES.	
18x30 inches	11,616	7x 7 feet	888
30x30 "	6,968	7x 8 "	777
18x34 "	10,250	7x 9 "	691
34x34 "	5,426	7x10 "	662
15x48 "	8,712	8x 8 "	680
20x36 "	8,712	8x 9 "	605
18x36 "	9,680	8x10 "	544
36x36 "	4,825	8x11 "	495
18x42 "	8,297	8x12 "	453
18x48 "	7,260		

RASPBERRIES, BLACKBERRIES, ETC.

3x5 feet	2,904	3x7 feet	2,074
3x6 "	2,420	3x8 "	1,815

THE FUTURE OF FRUIT GROWING.

The people have learned to love a fruit diet. The consumption is many times as large as a dozen years ago, and those who grow really delicious fruit will rarely or never fail of a ready market.

In the preceding pages I have tried to explain the methods I have employed, and believe that those who enter the work with that enthusiasm which is born of success, will always find it a neat, clean, genteel business.

The greatest need is to cultivate a determination to be the leader, and never for a moment entertain a thought of failure.

If you expect no drawbacks, no annoyances, no blights, no frosts, no drouths, no seasons of low prices, you will probably be disappointed. Your energy and thoughtfulness will guard against them. I repeat here, that for fifteen years I have never had an unprofitable season, and I can now look back and say as a whole it has been a life of delights and pleasures.

People rush in when berries are very high, and the next season, there being a great acreage, prices are low and they rush out again leaving the market to the "First Fiddlers."

In conclusion permit me to bid you a God speed in the work.

R. M. KELLOGG.

MEMORANDUM OF ORDER SENT.

Please cut out the sheet on opposite page and send your order on it. On this page make an exact copy, and give the date and number of check and amount sent, for your own use.

Date,.....*1898.*

Write your name plainly—print it. We are very often obliged to guess at the name of person as well as postoffice. Keep a copy of your letter, if you send one.

Use the strong printed envelope found in the catalogue.

NUMBER OF PLANTS	NAME OF VARIETY	PRICE	
	If plants ordered sent by mail, postage sent.		

PLEASE CUT THIS SHEET OUT TO SEND YOUR ORDER ON.

Date.....*1898.*

R. M. KELLOGG, Three Rivers, Mich.:

For the amount enclosed ($.....) please fill the following order.
Read Notice to Patrons on the inside of back cover before filling out your order.

Name.....
(Write name very plainly.)

Postoffice.....

County..... *State*.....

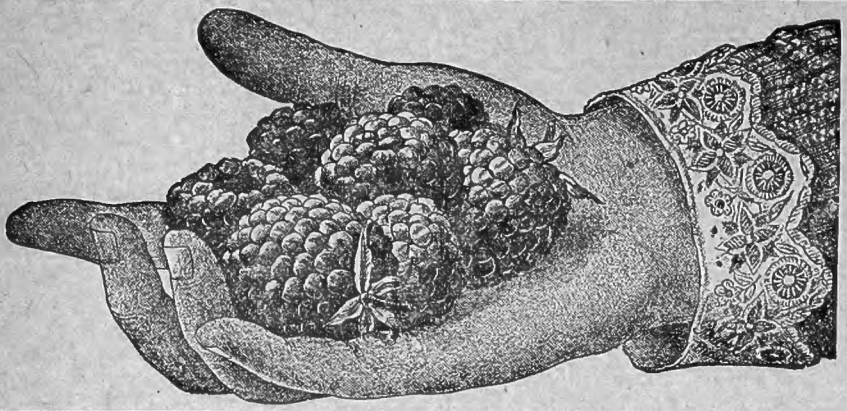
Ship by.....
(Say whether to be sent by freight, express, or mail.)

Name of Freight or Express } *Station is*.....

County..... *State*.....

QUANTITY	NAME OF PLANTS ORDERED	PRICE	
	AMOUNT FOR POSTAGE IF TO BE SENT BY MAIL		

The Great Family Luxury.



The Fruit Garden

A DELICIOUS FEAST
THROUGHOUT THE YEAR.

STRAWBERRIES over a month.
RASPBERRIES over a month.
BLACKBERRIES over a month.
LUSCIOUS GRAPES over two months.
And Delicious CANNED FRUIT all Winter.

A FRUIT DIET means a clear head, clear intellect and a strong body. The Rich Fruit Acids are the great panacea for aches, pains and the "blues." A small plat of ground, a few strong fruiting pedigree plants, of early and late varieties in succession with a little delightful evening recreation in caring for them and the pleasure is yours.

TO ENJOY THEM YOU MUST GROW THEM.

Spurious Plants bring disappointment. Strong Pedigree Plants bring enjoyment. Read carefully page 6 and 7.

Notice:—Send your orders in early so as to be sure of the varieties desired.

Send a postal card for a copy of this book next year.

Address all orders to **R. M. KELLOGG, Three, Rivers, Mich.**

Read the Other Side.

SPECIAL REASONS

WHY YOU SHOULD STOCK YOUR GROUNDS WITH PEDIGREE PLANTS.

They Will Bear Fruit because they have been Scientifically propagated by selecting perfect or ideal breeding plants through a long series of years. See first pages of "Great Crops of Small Fruit and How to Grow Them."

Potency of Pollen. These plants are entirely free from pollen exhaustion. The potency of their pollen and consequent ability to develope fruit is perfect because they have been kept under close restriction. See pages 1 and 2.

Trained to Develop Fine Fruit. Breeding Plants are allowed to fruit each year just enough to develop their powers in fruit bearing, but never allowed to approach the danger line of exhaustion. See page 1.

These Plants Will Grow because they have a strong constitutional vigor. All weak plants are thrown out every year. They are not injured by rapid freezing and thawing but are carefully mulched with straw so roots are never weakened. I know of no other nurseryman who takes this precaution. See page 15.

Skilful Packing. Our system of digging and packing is so perfected that roots are never exposed but a few seconds at one time and only fine spagnam moss is used for packing. They have been sent to Australia, Europe, and every state in the Union with perfect success.

Thoroughbred vs. Scrub Plants. The difference between a thoroughbred plant and a scrub plant is the same as that between a thoroughbred and a scrub animal. A thoroughbred has the ability to develop fine fruit: the scrub has no power to do so. See page 3.

It Pays to Use Thoroughbred Plants. The difference between plants of high fruiting power and ordinary plants of low vigor is the difference between a large crop of high priced berries and ready sale and a small crop of low priced berries and slow sale. See page 7.

Southern Fruit Growers read page 4.

Send for This Pamphlet next year. This pamphlet will be revised every year and the best things in fruit growing will be found in it. Send a postal card for it.

Address,

R. M. KELLOGG, Three Rivers, Mich.

Read The Other Side.

Notice to Patrons.

The plants herein offered are propagated from **Pure Pedigree Stock** and ideal plants, as explained in the chapter on "Improvement of Plants." I am confident they are the only plants obtainable propagated in this manner, and that their fruiting vigor cannot be equalled. While I practice the highest cultivation I know how to give, I have demonstrated that the vigor of my plants has been the basis of my success.

Orders Must Amount to One Dollar.

The correspondence, postage, and booking orders for less than that amount are only filled at a loss.

Free.

I will send the MICHIGAN FRUIT GROWER AND PRACTICAL FARMER free for thirteen weeks with every order for plants. It is the leading weekly farm and fruit paper published in the Great Fruit Belt of West Michigan and is the official organ of its leading horticultural societies. Among its contributors are the largest fruit growers of the State. I have accepted an engagement to write for the paper every week and conduct the question department. It will discuss all the new things in Horticulture.

Taking Up Strawberry Plants.

The whole row of plants is taken up, and all those poorly rooted are thrown out. The fork used for the purpose is so constructed that plants are not bruised or roots broken off. All dead leaves and stems are picked off and roots straightened by such a system that from the time they leave the ground until they are ready for shipment they are not exposed a half minute altogether.

Substitution.

We desire to furnish each customer exactly what he orders, but some times find the variety all sold before his order is reached, all orders being filled in the order in which they are received and booked. If no substitution is permitted we are obliged to disappoint the customer by returning the money late in the season. There are several varieties in the same season and of equal value, and if we are out of the variety ordered, and substitution is permitted, we will add 15 per cent in number to the plants substituted. Unless you expressly state "NO SUBSTITUTION," we will understand you desire your order filled as above stated. There is very little danger of not getting the varieties desired, if orders are sent in early.

Price of Plants.

The prices quoted are net, and the lowest at which they can be grown and placed on the market. This list abrogates all former price lists. Plants cannot be furnished at these rates in July, August or September.

The price is for the quantity specified, but not less than six of any one variety will be furnished at dozen rates, 50 at 100 rates, 500 at 1,000 rates. Plants at 1,000 rates can only be sent by freight or express.

No Discounts and No Agents.

In view of the fact that so many tree dealers and agents have used my catalogue, and represented themselves as my agents, and then delivered cheap plants from other nurserymen, thus greatly injuring my reputation, I am forced to announce that I do not accept orders from agents. No other nurseryman in this country propagates plants by my method, so when an agent represents he is selling pedigree stock, it will be safe to give him the go by.

Terms

strictly cash with order. Orders are booked when one-third the amount is remitted, and balance before shipment. Plants will be sent C. O. D., if one-third is remitted with orders.

Order Early.

All orders are filled in the order in which they are received, hence the earlier they are sent in the better.

How to Remit.

Send money by postoffice order, bank draft, express order or registered letter. I cannot be responsible for money sent loose in a letter.

References.

You can get my commercial credit and standing at any bank, factory or store using R. G. Dun & Co. or Bradstreet's commercial reports; or write to First National Bank, postmaster, agents American and United States Express Companies, Three Rivers, Mich.

No charge will be made for packing, crates or boxes, and delivery to forwarders.

Plants by Mail.

Plants are packed with spagnum moss, oiled manilla paper, with leaves exposed, so that they will go safely to any part of the United States for one cent for each two ounces (or eight cents per pound), and to Canada at one cent per ounce. We send plants as far east as Nova Scotia, and west to British Columbia, with entire success.

Postage

is as follows, which must be added to price list: Strawberry plants, 5 cents per dozen; 25 cents per 100. One year grape vines, 10 cents per dozen; 25 cents per 50, and 40 cents per 100. Raspberries, 10 cents per dozen, 50 cents per 100.

Express Rates.

Express charges are twenty per cent less than general merchandise to any part of the country.

By Freight.

We have through car service every night over the Michigan Central and Lake Shore & Michigan Southern to Chicago, Toledo and Detroit, making close connection with all railroads reaching those points. Freight rates are very low and they generally go through on time, but some times delays occur; but we have tracers sent promptly when notified that they fail to arrive on time. Courts hold that property in transit belongs to consignee, and railroads and express companies are responsible and must pay for perishable goods spoiled by undue delay in shipment. If no shipping directions are given we use our best judgment without assuming any responsibility.

Guarantee of Genuineness.

The plants being propagated in special beds and labeled when taken up, would seem to preclude the possibility of mistake, and I guarantee plants true to label, with express understanding that if a mistake happens to be made, I am not to be held for any damages beyond the amount received for the plants.

Guaranteeing Results.

We send plants with entire success to the most distant states, to anybody and everybody who order them. I am exceedingly anxious that they shall meet their highest expectations, and to this end will do all in my power to contribute to success. But after they are delivered to express companies or railroads, they belong to the purchasers and I have no control over them. I do not know what treatment they are to receive, hence you can readily see why I can not, and do not, guarantee any results whatever. My responsibility ceases when delivered to express or railroad.

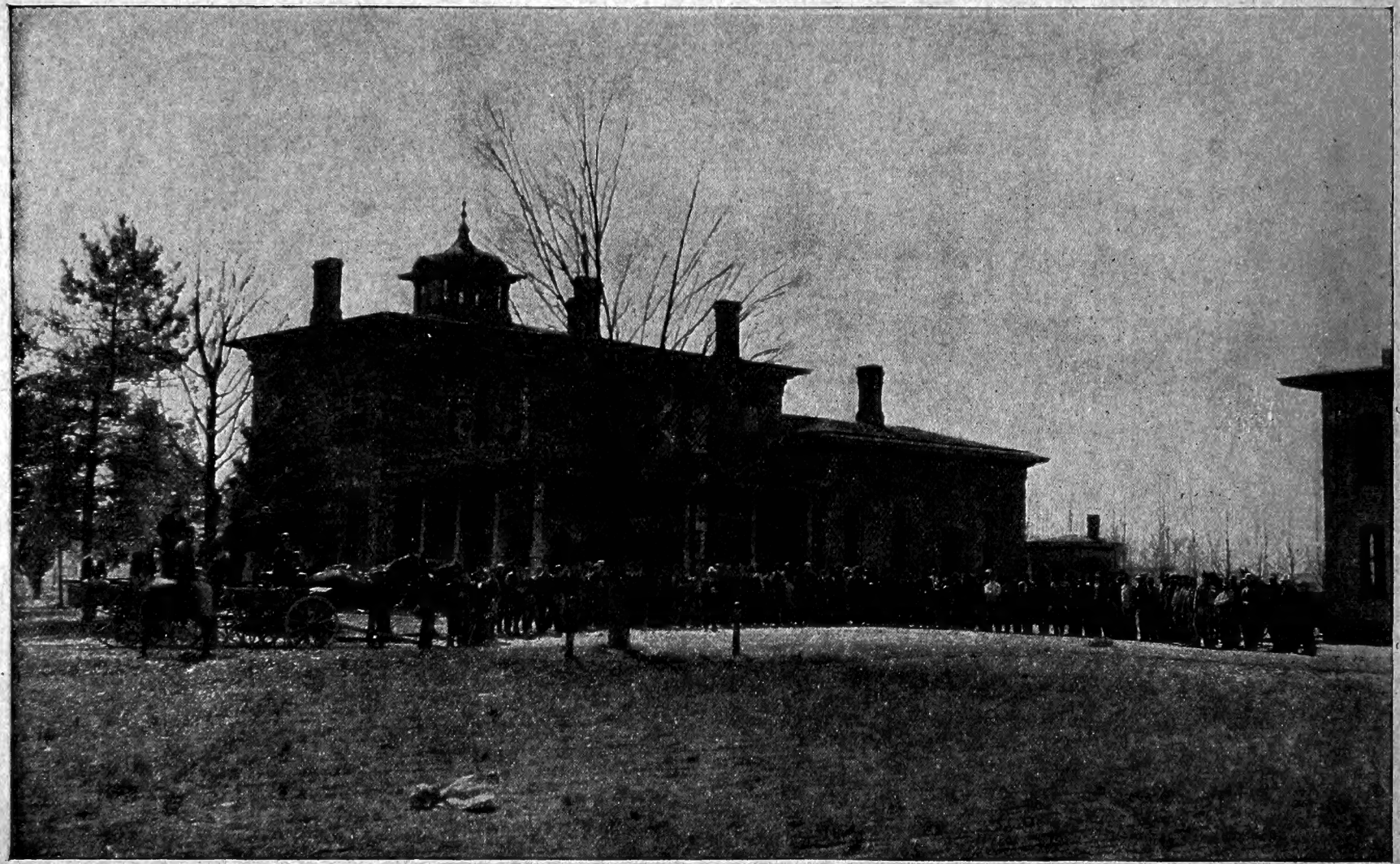
Orders are Acknowledged

as soon as received. If you do not hear from us after a reasonable time, write again.

This Pamphlet

Will be revised every year, giving all the new ideas and modern methods of culture, and will be sent free to any one requesting it. Do not loan this book, but let your friend send a postal card for it. If you do not receive one by January 20, 1899,

SEND FOR IT



PHOTOGRAPH OF REAR OF RESIDENCE AND OUR EMPLOYEES ANSWERING TO NOON DAY ROLL CALL—SEE PAGE 29