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CANTALOUPE.

—BY—

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"NETTED GEM" Cantaloupes, grown at Rockyford, Colo.

THE CANTALOUPE.

BY H. H. GRIFFIN.

INTRODUCTION.

The Arkansas Valley of Colorado has for some years been famous for its cantaloupes.

During the season of 1900, 780 cars were shipped, which represents the product from about 2,500 acres.

The cantaloupe is known as the "Rocky Ford" from the town that has led in the industry. The variety grown is the Netted Gem, which Burpee claims to have the distinction of originating. Through environment it has become so perfected in the vicinity of Rocky Ford as to be unsurpassed in quality, and needs only to be introduced in any market to at once take possession of it.

The melon plant is of rank growth and succulent tissue. It thrives best under conditions of high temperature, dry air, and continuous sunshine, and a deep, warm, sandy loam soil. It is as delicate in constitution as in texture. It does not adapt itself readily to varying conditions nor to sudden climatic changes, and its tissue offers little resistance to the attacks of fungi.

CULTIVATION.

Were it not that there are many amateurs growing this crop, owing to the rapid settling of the lands in the Arkansas valley of Colorado, this bulletin need not deal with this phase of the subject.

The first planting is done from the first to the tenth of May; seldom any advantage is gained by putting the seed in earlier than May 1st. The land is put in good condition by rather deep plowing, harrowing and leveling. Furrows are then run with a shovel plow from 6 to 7 feet apart and the seed planted by the side of the furrow, making the hills from 5 to 6 feet apart in the rows. Uniformity of planting facilitates cultivation, as for a considerable time the field may be cultivated in both directions. Care must be exercised not to plant the seed too deep. The depth should not exceed one inch.

Some growers irrigate the furrows and plant afterwards, while others plant and then irrigate, permitting the water to reach the seed by percolation. I prefer subirrigation to

germinate the seed, as the soil is apt to become crusted and dry if it is handled and pressed after irrigation.

Plenty of seed should be used—from 10 to 15 seeds to each hill—and when the plants have put forth four leaves, thin to three plants for each hill. Cultivate and hoe sufficiently to secure good tilth until the vines run well, or are from two to three feet across the hill. Then the irrigating furrows should be run and cultivation cease, giving such hoeing as will keep down weeds.

SEED.

Good seed is a prime requisite for success with the cantaloupe, but not enough attention has been paid to the selection of it. Few have made any systematic selection of seed, looking well to the shape, size, solidity, depth of flesh, seed cavity, color of flesh and quality. Many have bought from dealers who knew little of the quality of seed sold, and the result is that many melons sold as "Rocky Ford" are not up to the standard. The effect of poor seed is more apparent in those districts in which there are many amateur growers, than where the older growers predominate.

A pure Rocky Ford cantaloupe when ripe should have a silver colored netting which is lace-like in appearance. The skin should be green turning to a peculiar gray color when the melon is fit for shipping. The flesh should be green in color and so sweet and luscious that it may be eaten close to the rind. The melon should have a small seed cavity and the portion of the flesh immediately surrounding it be slightly tinged with yellow. The melon should weigh about one and one-half pounds and be very solid and firm.

The cantaloupe growers should save seed from the very best melons, for in this way only can the quality be maintained or improved. No grower should save seed for his planting without testing the quality of the melon. Occasionally a melon may be perfect in appearance, but not of first rate quality.

HARVESTING.

Much seed is shipped to points outside the state and the product from this seed is shipped to market as "Rocky Ford" melons. "Rocky Ford" melons, so called, are on the market about the time the melon is setting on the vines in the Arkansas valley. A few melons are shipped the first week in August, but heavy shipments do not commence before the middle of the month. The melons are picked into sacks, carried over the shoulders of the pickers, and are at

once taken to the shade—packing sheds being made for the purpose—where they are crated. The standard crate holds forty-five perfect melons, in three tiers of fifteen melons each, and weighs about sixty-nine pounds. There are also used, to some extent, the two-layer crate, which is two-thirds the size of the standard, and the "pony" crate holding forty-five melons, but smaller than those of standard size. The standard crate is (inside measurement) 22 inches long, 12 inches wide and 13 inches deep.

When it is proper time to pick for shipment, the stem slightly parts from the melon. No stem tissue should adhere to the melon, but there should be a smooth surface where the stem was attached. The netting and skin has a peculiar grayish appearance, which is easily distinguished when one becomes accustomed to picking.

The cantaloupe is very perishable and rapid transportation, in refrigerator cars, is required. By this means melons of good quality are placed in all of the markets of the eastern states. The shipping period (from the same vines) should extend over not less than thirty days; a more rapid ripening than this is generally indicative of unhealthy conditions. As high as 300 crates per acre have been taken from alfalfa sod, but 100 to 150 crates of marketable melons per acre is considered a good yield.

IRRIGATION.

The essential thing in irrigating is to keep the water confined to the furrow, reaching the roots only by percolation. This keeps the soil in good condition, does not cover the vines with mud, and leaves the fruit in dry condition. If the water stands on the fruit it is apt to induce decay or cause uncolored or soft spots, which make the product unsalable. It is common to irrigate every ten days, paying little attention to the needs of the plant. The tendency is to irrigate too often early in the season.

The most water is required about the time the blossoms commence to set well, previous to this giving only enough to keep the plant growing well. When the plant commences to bloom profusely, irrigate thoroughly and afterwards give only so much water as will keep the plant in good thrifty condition. A too moist condition is apt to increase the spread of any fungus trouble.

In 1899 three plats were used to test the effect of irrigation on quality and production. One plat had seven irrigations, June 19, 30, July 10, August 1, 17, 26, and Sep-

tember 4; another three irrigations, June 30, August 1, and September 4; and a third plat one irrigation, July 10. Heavy rains occurred in July, and considerable rain fell in August.

The plat irrigated but once did not yield so heavily as the others; the vines and fruit were smaller, but the fruit was of better quality. The plats numbered one and two yielded about the same, and as far as could be judged, the quality was the same. Evidently, plat No. 1 received twice as much water as was necessary.

FERTILIZERS.

Virgin soils produce good melons both in quality and quantity, but fertilization is soon a necessity. Since fungus troubles have become annoying, it is not advisable to apply any heating manure to the soil just previous to growing cantaloupes, as it has a tendency to increase the trouble.

A comparative trial in 1899 with melons grown on alfalfa sod, on cropped land manured with well rotted barnyard manure in the hill, and on cropped land fertilized with bone dust in the hill, showed the best results from the alfalfa. The product was nearly doubled, the quality was better, and the ability to resist fungus troubles greater. Alfalfa sod brings maximum returns, and in turn the melon easily subdues the alfalfa and puts the land in splendid condition for succeeding crops.

TRANSPLANTING.

A test was made in 1899 to note to what extent hot bed propagation may hasten maturity and how successfully it may be performed. The seed was put in the hot beds April 3. Some of the seed was put in cans, so arranged that the plants could be taken from them without disturbing the roots, while others were put in the bed without any support. It was found quite difficult to transplant them when the roots were at all disturbed. Fully 95 per cent of those set from the cans grew, while only about 50 per cent of those taken from the bed without support survived. May 8, the first plants were taken from the bed and set in the open field. The first seed planting in the open field was April 29 and the second May 10.

The first ripe melon was taken from the transplanted vines August 17, only one day earlier than melons grown on ground fertilized with alfalfa or manure, and only four days earlier than those grown without any fertilizer.

However, they ripened (in quantity) faster, and for the next ten days gave more ripe melons than any other planting.

DISEASE OF THE VINE.

Until recently the industry has advanced at a rapid pace, no disease or insect pest causing trouble of any consequence.

A blight or rust first attracted attention in a few fields in 1896, and there was a slight increase in its spread in 1897. No one gave it serious thought at first, and it was not until it became prevalent and the damage serious, that anyone realized to what extent it might cripple the industry. My attention was first called to it in 1898, when it became so prevalent in some fields as to do much injury to the crop at about the time the melons were ripe.

It first appeared in well defined centers on fields that had been cropped with melons continuously for some years. In 1899 it was apparent that the disease diminished as we receded from these centers, and, in most cases, it did not appear on the remote fields until later in the season.

The leaves were found to be covered with numerous brown spots, giving them a rusty appearance. The spots ran together, eventually killing the leaf. The stem was also covered with spots, and in some cases the melon was affected, the diseased tissue often extending to the heart of the melon.

Leaves and stems were sent to Prof. Crandall, who pronounced the trouble due to a fungus (*macrosporium*), but sent the specimens to Ellis and Everhart, who pronounced it a new species, naming it "*cucumcrinum*."

To the casual observer, the cantaloupe blight, which is caused by a true parasitic fungus, first appears as a number of brown spots about the size of a pin head upon the leaves in the center of the hill. A careful examination of the younger leaves shows where the fungus has been at work, sometime before it is apparent by the brown appearance. It can be seen where the leaf tissue has been eaten away, and when the injured tissue dies, then it is that the brown appearance occurs. These spots gradually enlarge until they may attain a diameter of half an inch, and the number sufficient to envelop the leaf and cause its death. In some badly affected fields can be seen spots of all gradations in size, from those just forming on the young leaves to those so large as to destroy the older leaf.

During nearly the whole season the cantaloupe is putting forth new growth that is very succulent, and this

parasite may be doing incalculable injury long before the grower is aware of its presence. This is especially true if the weather conditions are moist and favorable to its increase and spread.

EXPERIMENTS IN 1899 FOR THE CONTROL OF THE DISEASE.

Observing in 1898 that the disease was apparent only on certain fields, I made a collection of seed from these for planting the following year, to see if it was communicated by the seed. This seed was planted in the spring of 1899 away from other melons for the purpose above mentioned, and for some preliminary spray work for the control of the disease.

Three rows, each 250 feet long, were planted, the middle one being reserved for spraying with the Bordeaux mixture, using the others as checks. The row was sprayed June 22, and again June 30, with Bordeaux mixture—4 pounds of copper sulphate (blue stone) to 40 gallons of water. At this time there was something on the vines that looked like blight. The next spraying was done the 22d of July, at which time the blight was in evidence and spreading rapidly. The row was again sprayed July 31 and August 11.

The weather previous to June 19 had been very dry. Subsequent observations have shown that the spread of the disease, previous to this time, would not have been rapid enough to be discerned, even if the weather had been moist.

After June 20, rain and dews were plentiful; seven inches of rain fell during July, 5.14 inches of this in the week commencing July 14. The vines were completely submerged and the spray, no doubt, mostly destroyed. The weather conditions following were very favorable to the spread of the disease.

Owing to the weather conditions during July, it was not apparent that any benefit was secured from the two early sprayings, but a decided benefit was obtained from those made after July 22.

The sprayed vines remained green and in a growing condition long after the others had succumbed to the disease, and fruit of good quality was picked from them the first week in September. Two weeks previous to this the last merchantable melons were taken from the unsprayed vines and they, at all times, were inferior in quality to those picked from the sprayed vines. They ripened prematurely and the taste was insipid; this alone being sufficient

guide to determine from which vines the melons came. It could not be said that the infection came from the seed, for these vines were no worse infected with the blight than other melons on the station property or in the adjacent country. Some of the seed was held over for planting in 1900, and the results are like those mentioned.

All of the fields in the vicinity of Rocky Ford were more or less affected with the disease, the spread being much more rapid than anyone anticipated. This caused us to inaugurate experimental work, late in the season, for its control.

There were, at the station, seven rows of cantaloupes, each 275 feet long, on alfalfa sod. One of these was sprayed with the Bordeaux mixture July 31, and again August 11. This work confirmed the results enumerated above.

Another row was sprayed with the ammoniacal copper carbonate solution (1 oz. to 6 gallons of water) August 4, and again August 8 and 11. Some benefit was secured from this spray, in the same way it was with the Bordeaux mixture, but it was not so pronounced, nor does the spray adhere so well to the plant.

Mr. I. D. Hale had some June planted melons which we secured for experimental purposes. They were sprayed with the Bordeaux mixture July 27, and again July 31 and August 11.

About one-eighth of an acre of melons was sprayed for G. W. Swink, August 15 and 16. Owing to press of work only one application was given these vines, but the benefit from the spray was quite marked when compared with the remainder of the field.

August 21 we sprayed about one acre of late melons at I. D. Hale's, in which the blight was very bad; it appeared as though no returns could be secured from the field. Even after the vines were thus affected there was a marked improvement in the appearance of the vines, and the fruit did not deteriorate in quality nearly so rapidly as in an unsprayed portion of the field.

Mr. C. S. Fenlason had about $1\frac{3}{4}$ acres of late melons which were secured to spray, to verify previous results and to further study the cost of the work. The vines were very large, completely covering the ground.

A barrel of spray mixture was put in a slip scraper which was pulled backwards, and two rows taken on each side. The work was done August 22 and 23. Twenty-two pounds of copper sulphate were used to make

the spray. It required three men and one horse thirteen hours (together with a boy about two hours to turn the vines) to complete the work. The cost was estimated at \$6.75 per acre.

Three hundred crates of good melons were sold from the field. Mr. Fenlason thinks the spray saved the crop from destruction. A few vines in this field were not sprayed and the advance of the disease on these was very noticeable. An adjoining field of melons so succumbed to the disease as to be of little value. The results of the year were of one accord; confirming the benefits from the spray as above mentioned.

EXPERIMENTS OF 1900.

The cantaloupe season was very dry and hot, and hence extremely favorable to the vine and unfavorable to the spread of the disease, so that the results have not been so marked as was the case in 1899, when rain was prevalent.

May 8 about six-sevenths of an acre of alfalfa sod was planted to cantaloupes, it being the intention to spray portions of it at stated intervals for the purpose of testing what number of sprayings would be the most efficient. June 11 the blight seemed to be making its appearance and the vines as yet not running. The same appearance was also found in other fields. June 13 the most of this patch was sprayed with Bordeaux mixture, July 11 sprayed the second time, and July 31 a portion of them sprayed for the third time.

The weather continued extremely dry and hot during July and August, and in but few places was there any rapid spread of the disease. There was no appreciable benefit from the third spraying.

Comparing the sprayed vines with checks and with adjoining unsprayed fields, there was an appreciable difference in the appearance of the vines, in the quality of the fruit, and the manner in which it ripened. During the last of August, the fruit on the sprayed vines was ripening slowly, while the unsprayed vines were giving up their fruit rapidly.

About four acres of melons, belonging to leasers on the station, were used for experimental purposes. Two acres of this field were sprayed June 14 while the vines were quite small, but few of them running. A second spraying was given them from July 7 to 12, at which time they were running considerable.

A third acre was sprayed July 28 for the first time, which was done for the purpose of noting the effect of late spraying. The blight was showing considerably in the center of the hills, but not spreading to any appreciable extent. After this spraying there was a peculiar appearance of the edges of the leaf (which to some might be alarming). Much of the portion assuming this appearance was brown at the time of spraying, but the centers remained green and the leaves retained their vitality, which was not the case with those unsprayed. This appearance of the edge of the leaf did not occur with those sprayed early, and its appearance is something for which I am not able to account. The remaining acre was not sprayed, for the purpose of a check upon the work.

The most noticeable feature to the parties picking the product from the field was the rapidity with which the unsprayed portion ripened its fruit. Soon after harvesting commenced the yield on this acre was twice as great as on an equal area of sprayed vines, and the quality was not so good. The melons were ripe and picked on this acre fully two weeks before they were on the other three acres. Those having the field in charge were in doubt, when the work commenced, whether there was any efficacy in the spray, but the ripening of the fruit dispelled any such doubt. There was an appreciable difference in the appearance of the vines, and this was discernable for some distance. People who saw the vines early in September would remark as to their health and vigor, and they continued to bear until frost.

Owing to the continued dry weather, the two early sprayings seemed to be all that was required, and were preferable to the one spraying done later. Had moist conditions arisen, it is probable that one or two more sprayings would have been necessary. However, the results from the late work gave evidence that good results can be secured from the late applications.

What has been said is further substantiated by results in other fields near by, in which the vines and crop were, at one time, more promising, but (due to the diseased conditions) ripened their fruit too rapidly, unevenly, and the quality was undesirable. On these fields the spread of the disease from day to day was apparent during the latter part of August and the first week of September.

An ordinary field of cantaloupes should not yield, during the height of the season, more than twelve crates of

marketable melons per acre per day, but on some diseased fields it was not uncommon for more than twice that amount to be taken.

As a further test of the efficacy of the Bordeaux spray, four acres were sprayed in the field belonging to John Deweese. The first application was made June 18, and the second July 7, it being the intention to give a third, but press of work prevented it. One row was left through the center as a check, and the results showed a decided benefit to the vines and the ripening of the fruit. This was especially marked when comparison was made with an adjoining field that was planted later, but which matured its fruit earlier, owing to the disease.

Mr. Deweese feels that the spraying saved a considerable part of his crop. His greatest yield from the four acres did not exceed 50 crates per day, in a total yield of about 600 crates. When the season was nearly closed and the vines had been tramped and injured, the benefit, from the appearance of the leaves, was still apparent.

I had under observation four fields, in which spraying had been done by farmers who were incited to do the work by the results of the previous year. Some were highly pleased with the results, and in no case was there a failure to derive some benefit.

I wish to emphasize what has been said in regard to the benefit on the quality of the fruit—the value of the spray is not by any means to the vines alone. It keeps the vine in better health, and the necessary vitality is secured for the proper development of the fruit.

COST OF SPRAYING.

A record of expense on the field of John Deweese for labor and material is as follows: June 18, 4 hours with 3 men, 1 team and $1\frac{1}{2}$ barrels of spray mixture. July 7, 9 hours with 3 men, 1 team and $3\frac{1}{2}$ barrels of spray mixture. An estimated total of \$9.80 for two sprayings on the four acres.

The cost of spraying the two acres on the station, twice, is as follows: June 14, $1\frac{1}{2}$ hours with 3 men, 1 team and 1 barrel of spray mixture. July 7 to 12, $2\frac{3}{4}$ hours with 3 men, 1 team and $1\frac{1}{3}$ barrels of spray. The acre sprayed July 28 required 3 hours with 3 men, 1 team and $1\frac{1}{2}$ barrels of spray, together with 1 hour for 1 man to turn the vines. This makes an average cost of \$4.47 for spraying an acre three times. The vines varied in size from those just running to vines from 3 to 4 feet across.

These estimates, together with those for 1899 at Mr. Fenlason's, cover the cost at all stages of the melon's growth, and from this one can tell approximately what the cost will be, taking into consideration the size of the vines. The price of copper sulphate (blue stone) is assumed to be ten cents per pound in these estimates.

Our appliance for doing the work in 1900 was a platform arranged on two wheels of a grain drill, upon which was a barrel containing a spray pump. Two lengths of hose were attached to the pump, sufficient to cover from 4 to 6 rows at a time, depending upon their size. The double-trees were spread to correspond with the width of the wheels and allowed the team and cart to spread over one row.

ACTION OF THE FUNGICIDE.

The object in applying the fungicide is to destroy the fungus without injuring the plant tissue. Further infection will be prevented and the tissue that the parasite would otherwise appropriate will be left to perform the functions of the plant.

The Bordeaux mixture is a combination of copper sulphate (blue stone), lime and water. The lime unites with the sulphuric acid, forming gypsum, and the copper is left in an insoluble condition which the gypsum tends to cement to the leaf. The carbonic acid of the air and the ammonia of the rain and dew dissolve slight amounts of the copper. It is very essential, when preparing this mixture, to use plenty of lime—an excess will do no harm. Experiments have shown that when an excess is used the copper is slower dissolved and, consequently, held on the plant longer. There are a number of ways the copper may act upon the fungus.

The spores may be prevented from germinating by inhibitory action; the spores may be killed outright before germination has commenced; the germ may be so weakened as to be unable to enter the host plant; or the presence of the copper on the leaf may impede the fruiting of the fungus already within the tissue of the plant. I believe the efficacy of the spray is due to the destruction of a considerable portion of the fungus growth present and to the prevention of the germination of the spores upon the new tissue. That the spray quickly prevents the enlargement of the spots is plainly to be seen.

The spores of the fungus, no doubt, germinate, grow and produce spores in a few days, but this period of growth may be hastened or greatly retarded by the weather con-

ditions that prevail, and for this reason the results may vary, according as one is fortunate in applying the spray at just the time when it may be most destructive to the fungus. The development of spores apparently takes place faster in late than in early season, which, no doubt, accounts for the greater rapidity of its spread later in the season.

EFFECT OF WEATHER CONDITIONS.

The season of 1899, being alternately wet and dry, afforded an opportunity to study the effect of weather upon the development of the fungus. When moist conditions prevailed, its spread was so rapid that it was plainly apparent, but dry weather at once checked it.

The number of sprayings required, and the time at which the spraying should be done, will have to be regulated largely by the weather conditions. When it is remembered that there may be, under favorable conditions, many successive crops (so to speak) of the fungus, and that moist, humid conditions are the most favorable for its growth, the grower will have to be guided by the weather in choosing the time for making the application.

The grower is mostly interested in preserving the leaves in the center of the hill, and for the purpose of doing this we think it well to give one or two sprayings about the time the vines commence running. The leaves in the center of the hill give protection to the major portion of the marketable melons.

The season of 1900 was extremely dry and may be considered as unfavorable for the blight as any season could be, and yet the disease was prevalent. While it did not develop to such a degree as to greatly impair the quality of the fruit in the majority of fields, yet in most instances there was more or less injury. In some fields the shipping season was shortened fully one-half, and the product was of inferior quality.

It is far preferable that weather conditions should keep the disease under control every year, but as the disease was prevalent in 1900, the farmer must expect to be obliged to cope with it under the weather conditions that usually prevail.

The farmer must not think, from what has been said in the preceding pages, that perfect immunity is secured by the use of the spray. All that can be hoped for is such control of the disease that melons of good quality may be secured, and the shipping season prolonged to near the

same period that it would be if perfectly healthy conditions prevailed.

The subject is not exhausted in this report, but we have done enough work to warrant giving information to the farmer, that he may be able to cope with the trouble to the fullest extent that our knowledge, at present, will enable him to do.

PREVALENCE OF THE BLIGHT.

No evidence could be secured in 1899 that the disease occurred in any other locality than that of Rocky Ford. In 1900 I found it in all parts of the valley, with the possible exception of Pueblo. Many farmers are yet totally ignorant of its appearance, especially when it is not present in sufficient quantity to cause any rapid deterioration of the crop. A farmer, whose field was badly infested with lice and blight, cited the fact that he had shipped 200 crates per acre from the field. Inquiry revealed the fact that the shipping period had not extended over more than two weeks, and that many melons of inferior quality had been taken because, just at that time, the supply of melons was not equal to the demands of the market.

INJURY TO BEES.

Many hives of bees stood near one of the fields treated. The apiarist found no dead bees, nor could it be seen that any harm resulted to the bees. The blossoms of the melons live only three or four days, so that no great number of sprayed blossoms are on the plant at any one time. Most of the flowers are well protected by the leaves, so that but little of the spray reaches the center of the flower.

FORMULA FOR MAKING THE SPRAY.

Dissolve 4 lbs. of copper sulphate (blue stone).

Slake 4 lbs. of fresh lime.

When the lime has become cool drain off the milk, adding it to the copper sulphate solution; then dilute with water until there are 40 gallons of the mixture. These proportions we have found to be about right, but care must be exercised to use plenty of lime, or otherwise the acid will burn the foliage. It is better to err on the part of too much lime than not enough. A stronger solution can be used with impunity, but we have found as good results from this as from the stronger.

POLLINATION.

The number of flowers born by a single melon vine is something astonishing. This is no less striking than the disparity existing between the male and female flowers. An account was kept on six vines from June 27, the time of blooming, until July 13, at which time the vines had become so interlapped that individual vines could not be distinguished.

The table shows the dates on which the flowers were counted and the number of flowers that had formed at each time. The total number of male flowers formed was 3,075 and the number of female was 253; an average to each hill of 512 male and 42 female flowers to July 13:

Date.	No. of Male Flowers.	No. of Female Flowers.
June 27	203	1
June 30	338	11
July 3	474	28
July 7	755	95
July 10	660	87
July 13	645	31

It must be remembered that the vines continue to bloom profusely until late in August and melons may ripen that are set about the middle of August.

Twenty ripe melons to each vine is considered a heavy yield. In the above table we have more than 40 female flowers (to each hill) produced in the first two weeks of the blossoming period.

The first blossom appeared on June 27, and the first ripe melon was taken August 11. It takes about six weeks from the time of the setting for the fruit to ripen. Some farmers become alarmed when the first flowers that are formed drop without setting fruit, but the figures reveal the fact that the most of these are not fruit bearing flowers.

INSECT PESTS OF THE CANTALOUPE.

Flea beetle—This is a small black beetle that devours the leaf soon after the melons are up. Dusting the plants with air slaked lime in early morning when they are damp, or spraying them with a mixture of 1 lb. of Paris green and 1 lb. of lime to 150 gallons of water, will remedy the trouble.

Striped cucumber beetle—This little striped insect is familiar to all, appearing in the spring soon after the melons

are up. It has not appeared at the station since June, 1898, at which time trials for its control were cut short by a severe hail storm. I have seen good results from dusting the plants with Paris green in air slacked lime, but it is only a repellent, and hence the effect is temporary. It will drive them away for a time, but they may return with the next passing wind. In the short space of time we were enabled to combat it, we found kerosene emulsion quite effective. It acts as a repellent and kills with sufficient contact.

In Bulletin 158 of the Geneva (N. Y.) station, Bordeaux mixture was found to be the most efficient of many remedies tried. From a knowledge of its repellent properties, we are of the opinion that it will do all that is claimed for it. Its use will be a double one—for the insect and the blight. The insect is not present every year, but is very destructive when it does appear.

Geometer or measuring worm—This worm did much harm in 1900 by eating away the parenchyma of the leaf from the under side. It appeared about June 18 and was very near the color of the leaf, and exceedingly small. It was sometimes difficult to discern, and did much injury before many were aware of its presence. These worms are numerous every year on lettuce, cabbage, etc., but last year was the first time I have known them to attack cantaloupes. I noticed when we had sprayed with Bordeaux mixture for the blight, that but few of the worms were present.

We also used a spray of Paris green, 1 lb. and lime, 1 lb. to 150 gallons of water, which was effective. In using Bordeaux mixture for the blight the poison can be added to lessen the numbers of the insect, and thus apply a remedy for both evils at the same time.

Melon louse—This is the only insect that may cause alarm to the melon growers. In the eastern part of the valley it has secured such a hold that drastic measures will probably have to be taken for its suppression. I saw many melon fields in 1900 almost ruined by this insect. The insects were so numerous that the vines over whole fields were black from the excretion of honey-dew. They were so numerous as to cause inconvenience to the pickers, and yet there were many growers not aware that the insect was present in the field. The lice were sapping the vitality of the vines and destroying the quality of the product.

The insect breeds and feeds upon a great variety of plants, many of which are the common weeds of our fields. Winged forms will appear and migrate to the melons. The

lice reproduce so rapidly that once they become established it may be only a short time until the whole field is infested.

Probably the best remedy is a preventive one, which consists in keeping the weeds cleared from surrounding fields, and the burning or plowing under of all vines and rubbish in the fall. Close watch should be kept early in the season, when hoeing and thinning, for any appearance of the insect.

It is a small, green insect that attaches itself to the under side of the leaf. Close observation is necessary to discern it when it first appears. The insect secures its sustenance by sucking the sap from the leaf, and only contact remedies, such as kerosene emulsion, will be of service.

If but few hills are attacked, they may be destroyed, but this is not desirable. If the field becomes infested with this insect, spray the under side of the leaves thoroughly with the kerosene emulsion (diluted 30 times) to keep it in check. As soon as the melons are harvested, put in the plow with rolling coulter attached and turn the vines under deeply. Do not use the same land to grow melons the succeeding year.