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First Biennial Report

OF

STATE HORTICULTURIST

TO

The State Board of Agriculture



FORT COLLINS, COLORADO

NOVEMBER 30th

1914

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Fort Collins, Colo., November 30, 1914.

HON. A. A. EDWARDS,

President of the State Board of Agriculture,
Fort Collins, Colorado.

DEAR SIR:

I herewith respectfully submit the First Biennial Report as State Horticulturist for the year ending November 30, 1914.

No report was made for the year 1913, as there were no funds available for the office, and consequently no work was done.

Respectfully submitted,

E. P. SANDSTEN,

State Horticulturist.

Report of State Horticulturist

INTRODUCTION

In making this report, I feel that some preliminary statements should be made with reference to the appropriation made for the Office of the State Horticulturist.

No systematic work of permanent nature can be undertaken by the State Horticulturist until the State Appropriation made for the Office becomes a certainty and becomes available at the beginning of the biennium.

Under the present system, there is no assurance that the appropriation made by the legislature will be paid, or if paid, when. During the present biennium, 50% of the total appropriation became available about May 1, 1914, while during the first seventeen months, no funds were available. Later 80% became available. Under such conditions it is impossible to carry on systematic work, nor can the horticultural interests of the State be served, as was the intention of the Act. Further, the work carried on under the existing conditions of finances is unsatisfactory, both to the fruit growers and the State Horticulturist. Again, it is manifestly impossible to wisely and economically spend the available appropriation within the short time between the date of release and the close of the fiscal year. In other words, the State Horticulturist is supposed to spend, during the last quarter of the biennium, the total of the available portion intended for the four quarters. He is not permitted to anticipate any portion of the appropriation, and consequently cannot plan ahead.

The above explains why this Report covers only a period of seven months, or the time during which funds were available.

NITER BURNING IN COLORADO ORCHARDS

When the State Horticulturist was notified that 50 percent of the State appropriation was available, arrangements were made for carrying on some investigational work on the Western Slope, especially in the Grand Valley in the vicinity of Grand Junction. Complaints have been numerous during the year that many orchards in this section were rapidly dying, and that a large acreage, previously in fruit, was annually converted into farm land.

The investigation work of Dr. Headden and Professor Sackett* has established that the cause for this wholesale destruction of fruit

*See Bulletins 160, 178, 179, Colorado Experiment Station.

trees was due in the main to the presence, and the rapid accumulation of excessive amounts of niter. This excessive amount of niter seriously interferes with the health of the trees, causing the foliage to turn brown, and finally, the death of the trees. Serious losses to the fruit growers have resulted from this source, not only through the loss of the fruit trees, but also from the decrease in the value of the land.

The object of the work undertaken was to discover some practical method of either neutralizing or eliminating the excessive niter in the soil, so as to restore the land to its former condition, or at least to make tree growth possible. In planning the work, it was necessary to find some practical way, or ways, by which the desired result could be obtained without heavy expense, or cost to the land owners.

The niter salts being very soluble in water, it was determined:

First, to discover if it were possible to wash out the salts by large and frequent applications of water. This, of course, is only possible where the water supply is abundant and the land has sufficient slope to carry off the surplus water, and also where the ground water table was sufficiently deep below the surface to insure percolation.

Second, the soil in the Grand Valley being uniformly deficient in vegetable matter, it was thought that this fact might have a bearing upon the activity of the niter forming organism, and to test this view, arrangements were made to grow various kinds of green crops on the niter land, and when these had reached a certain stage of development or growth, have them plowed under. In this manner, large quantities of vegetable matter or humus would be added to the soil, and thus in a measure neutralize the action of the niter salts.

The work, as above outlined, was carried on during the past season. Arrangements were made with two fruit growers, whereby the the State Horticulturist took over the land and directed the work. One of these places was so badly infested with niter that for the last four or five years no vegetation could be grown, and even the common weeds failed to grow. This land was laid out into two sections: One, which was enclosed with an embankment of soil to the height of 12 to 14 inches. The water was then led within this embankment and kept sufficiently deep to cover the land entirely. The water was held within this embankment for several days, and additional water was constantly added, so as to keep the level of the water at the same height. In this way the water gradually percolated the soil and carried with it the soluble niter salts. The embankments were then removed, and when sufficiently dry, the land was harrowed and seeded to winter rye. The success of this flooding was very pronounced, as the seed sown came

up rapidly and made a heavy growth, thus confirming our opinion that the land can be re-claimed by thorough washing.

The remainder of the field, to the extent of about two acres, was seeded to a number of crops, but not one of them came up. In other words, the land remained barren of vegetation.

Later in the season, the two acres of land was surface cultivated and seeded to rye, and then furrowed out, or creased, at close intervals and water was run in these creases or furrows for several days at a time, and later on at intervals of four or five days. It was thought that by permitting the water to run in the furrows, the niter salts would gradually be washed out, thus permitting the seed that happened to fall along these creases where the water was running, to germinate and grow. This turned out to be the case. While the seed that happened to fall between the creases or on top of the creases did not come up, yet a fair stand was obtained along the edges of the creases.

On a portion of the two acres, due to the shortage of water, a poor stand was obtained which later in the season killed out entirely. This method was not a complete success, due to water shortage, which prevented frequent flooding in the furrows. Consequently, the soil was only partially washed and enough niter remained to interfere with the growth of the plants.

The writer believes that with frequent irrigation and care, this, and similar lands can be re-claimed, or at least be re-claimed so that ordinary farm crops can be grown.

The object of this experiment was to ascertain whether land that had been completely ruined by the presence of niter could again be restored to its normal conditions, and at reasonable expense.

Judging from the work thus far done, the writer has hopes that this can be accomplished, and at a cost well within the means of the land owners.

The other experiment was located in an orchard that was just beginning to show the effect of niter. Many of the trees were in the first stages of niter-burn, showing the characteristic browning of the margin of the leaves, and if this burning continues to increase without being checked, the trees will die within a comparatively short time. To check the increase of niter in this particular orchard, it was decided to try the effect of growing cover-crops and plow these under, thereby in a measure check the niter accumulation, and at the same time improve the general soil conditions. This practice, if successful on land not too heavily impregnated with niter,

would fit in with the best of methods of orchard tillage, and thus would entail no additional expense to the orchardist.

Some little difficulty was experienced in getting a stand of crops like oats, rape and vetch, due mainly to the fact that the trees were planted too closely. This condition obtains in many of Colorado orchards, especially the older ones. The close planting creates a deep shade which, aided by scanty irrigation between the tree rows, made the stand of the cover crop poor. This was especially true in the case of the oats, while the rape and vetch did fairly well. Late growing crops, or crops like vetch and rape, which grow considerably after the leaves of the trees have fallen, if the ground is not frozen, are the best crops to grow.

If the hairy vetch proves hardy it will make one of the best cover crops, as it can be sown late, remains green through the winter, and starts to grow early in the spring. It can also be plowed under early. Further work along this line must be carried on, before definite recommendation can be made. It is hoped that this work can be continued for several years, and that the appropriation for the work will become available in time.

FRUIT GROWERS' MEETINGS

During the past year, eighteen Fruit Growers' Meetings were held in the fruit growing districts, with an attendance of over three thousand people. The questions of cover crops, general orchard management, tillage, irrigation, pruning, thinning, grading and packing were fully discussed.

The fruit growers present showed an unusual interest in these meetings and the topics discussed. Frequent and free exchange of experience on the various topics prove that the growers were not only interested, but that they are very much alive to those questions which vitally affect the fruit growing industry of the State.

Whenever possible, actual field demonstrations were given in connection with the lectures. These demonstrations are of great value, since it enables the growers to actually see the way some of the operations in the orchards should be performed. Mere lectures on the fruit growers' problems are not nearly as effective as ocular demonstrations. These field demonstrations should, in the future, play more of a role in the education of our fruit growers than the lecture platform. The growers themselves realize this, and as a consequence, the writer has had numerous requests for field meetings. These meetings have also had the effect of forming a closer relation between the fruit grower and the Agricultural College, to the mutual advantage of both.

Perhaps the most effective work of the State Horticulturist has been in the visiting of the orchards and the growers, and talking over with them their troubles and problems. These personal visits always carry a personal message, and the grower feels that the College and the State Horticulturist have a personal interest in his future success, and in his work.

In going from orchard to orchard in the State, the Horticulturist has become acquainted with the local problems, and is in better position to give intelligent advice. It is not wise to give general information, as each section has its own peculiar problems to deal with, and it is vitally important that the State Horticulturist should know these local conditions, in order that he may be able to help in individual cases. General knowledge may be useful and interesting to the general public, but what the practical grower needs and wants is special information which will help him to solve his own peculiar difficulties.

In a large State like Colorado, personal visits and consultation in all the fruit growing districts is practically impossible, due to the inadequacy and uncertainty of the appropriation, though the Horticulturist has made strenuous efforts to inspect every district, and establish a personal relation with the grower.

PRESENT STATUS OF FRUIT GROWING IN COLORADO

The fruit growing industry of the State is now passing thru a period of readjustment, and when this period has passed, we may look for greater stability and profit.

In Colorado, as in many other fruit-growing districts, the development of the industry out-stripped the market and the selling facilities, with the result that a general demoralization took place. This demoralization reached its highest point during the present season. A number of factors are responsible for the present condition. The rapid development of our fruit district was followed with excessive boom prices, and an influx of settlers. The settlers, in many instances, were inexperienced in fruit growing, and with the general vicissitudes of fruit growing, failed to realize the profit that they had been made to expect.

In many instances the new settlers were not financially able to tide over the lean years, or during the years of crop failure, and consequently were forced this year to sell at any price obtainable, in order to meet the demands of their creditors. This general necessity for selling is in part responsible for the flooding of the market with all grades of fruits, when less rapid disposal would have steadied

the market and made it possible to realize a fair profit on the better grades of fruits. During years of fair prices, the growers felt no particular need of cooperation. Buyers were plentiful who either paid cash or solicited consignments. The grower did not have to solve the problem of marketing, as the market was at his door. Local associations handled a large share of the crop at profit both to themselves and the growers. Less attention was paid to the proper grading and packing, and each grower and selling agency adapted his own standard without regard for uniformity for the whole fruit growing district. These methods, while more or less satisfactory, during years of fair prices, greatly handicapped Colorado when we produced a maximum crop like the one the past season. During a season of large crop, poorly graded fruits come into direct competition with the better prepared products from other districts, greatly to our disadvantage.

It is true that the Colorado fruit was not driven out of the market, but lower prices were obtained in the competition. Further, it should be borne in mind that the old established associations of the Northwest were financially able to undersell the Colorado products, because the growers in these sections have been organized for years, and can afford to meet the vicissitudes of a season like the past.

The lack of standardization of our Colorado fruits, I consider to be the greatest handicap at the present, and until something is done to bring the various organizations and the growers into line, Colorado fruit will not be a serious competitor against the fruit of other sections. During years of heavy production, only the best fruit should be graded and packed, leaving the lower grades for by-products if possible, or for feeding to livestock. Nothing is gained by continually flooding the market, as it will only result in lower prices, while if only the higher grades were marketed, the prices could be maintained at a higher level.

The disposal of the lower grades of fruit is a serious question in Colorado. Canning and drying would undoubtedly pay for peaches and apricots, but with apples, the problem is more difficult. The canning of the lower grades of apples, especially for pie-making, and perhaps, drying, would be more profitable than cider and vinegar making. Colorado has two handicaps which prevents an economic utilization of our lower grades of fruit, namely, high cost of labor and freight rates. This is especially true when the grower has to compete with the Eastern fruit grower. In order for the manufacturers of fruit by-products to show a profit, he is forced to pay a

very low price for the fruit. In fact so low that the Colorado growers can hardly pay the expense of picking and handling the fruit. Then, too, the high price of his land makes it difficult to make a profit on the investment.

It is hoped that the State Horticulturist will be able to study the problem of utilization of low grade fruits in the future, as this problem needs to be studied from every view-point, in order that some returns may be realized from a large percentage of the crop that is now gone to waste, or if not wasted, no profit is obtained.

GRADING, PACKING AND SELLING THE FRUIT

It is maintained by many that the fruit grower is not in a position to satisfactorily sell his product; that his main concern is the production, and that the selling and distribution is better handled by an outsider. It is true that the average fruit grower has neither the experience nor the time to successfully dispose of his products, while the commission-man has established trade and customers, and hence is in position to handle the various products shipped to him on consignment.

In these days of low prices for fruits, the cost of selling, especially thru commission-houses, and even thru associations which go under the name of mutual associations, becomes a grave problem, as in many cases, the commission, freight, and cost of preparation for market absorb the total returns, leaving practically nothing for the fruit grower. In other words, the cost of getting the fruit to the ultimate consumer from the producer is as great or greater, than the original price of the product. It is this fact that has caused the great agitation for municipal markets, and the establishment of a direct connection between the producer and consumer. This defect in our marketing system is more apparent during a year of low prices like the present. During years of fair prices, the fruit grower is less concerned about the profits obtained by the middle man, as he, himself, is obtaining a fair return on his investment and labor. Any system that can insure the grower a fair return on his investment and labor, and at the same time place his products so that the consumer can obtain them at a reasonable price, will be welcomed by everybody, save, perhaps, the middle-man.

For Colorado it must be said that our Fruit Growers' Associations are run almost entirely on the commission basis, or on consignment, and these associations, with few exceptions, are not mutual concerns, but are operated by a group of men for profit, and naturally they look for the biggest returns on their investment, regardless, in many cases, of what the former receives.

So long as interest is paid on capital stock of these Associations, and so long as larger surpluses are accumulated, so long will they continue to be looked upon as business investments, and not as really mutual cooperative associations who aim at reasonable rates for selling. A really mutual organization whose stock or shares carry no dividends, but simply represent the fruit growers' interest and vote in the management of the Association, and whose profits at the end of the selling season are distributed pro rata, not on the stock, but on the amount of fruit contributed, is the only basis in which a truly mutual Association can exist. In other words, the Association should not make any more money, or charge any more for its services than is necessary to pay the running expenses connected with the work of the Association.

The history of commercial fruit growing in the Western United States reads like a romance. From a small beginning, the industry has grown until today it is truly national, and represents the investment of millions of dollars. Its development has not been accomplished without difficulties and draw-backs. The most successful fruit growing sections have passed thru the experience that the Colorado fruit growers are now passing, and are in the main on a permanent and profitable basis.

Naturally, every fruit grower is more or less of an individualist, and it is difficult for him to cooperate or combine with his fellow growers on a truly mutual basis. In the past, the Colorado grower has been able to market his fruit at satisfactory prices, and he felt little concern about his neighbors, but with the increase in production, and with the curtailing of certain markets, the competition between various sections has become very keen, and the local agencies of selling have failed in marketing his products at fair prices. Other sections better organized and older in business than Colorado are better able to bear the burden of a lean year than we are, and their competition in sections which have previously been left to Colorado has been a hard blow to the State. While we have met their prices, yet their fruit being better packed and graded, they have not infrequently occupied certain sections successfully, for when it comes to the cutting of prices in competition for a certain market, the Northwestern grower is much better able to compete than the Colorado growers are, because the industry, both as to production and selling, is on a much better basis than ours.

The question that most vitally concerns Colorado today as a fruit producing State is the question of grading and packing. It is admitted that third grade fruit is not worth marketing, and further, it is an established principle that merchandise not otherwise inferior,

but poorly packed or graded, always suffers in competition against perfectly graded and packed merchandise.

Anyone familiar with Colorado conditions as a fruit growing State, will admit that we can produce apples of equal grade and value that any other section of America can. Tho we have to admit that in competition with other sections, we suffer because of our inferior grading and packing. The fact that apples are cheap should not stop the fruit grower from properly grading his fruit, because in a year of heavy production, more care should be taken in offering only the best, so that the market may not be flooded with the medium or inferior goods. What is needed today in Colorado is a standard pack, a pack that would be uniform as to size and color, and maintained at the highest possible standard.

It should be a guarantee to the consumer, as well as to the middle-man. Such standard would eliminate the numerous complaints of inferior goods, and prevent or eliminate the counter-claims of the commission-houses against the producer. A State standard, rigidly enforced, possibly thru State inspection, would be necessary in the beginning to inaugurate such policy, but it would be money well invested, and would be returned in manifold to the producer.

It has been definitely settled by years of study and observation that each fruit growing section has from three to five standard varieties of apples which it can grow to perfection, and these varieties alone should be grown for commercial purposes. These varieties vary with the soil and climatic conditions, and it is seldom that the different sections will grow the same varieties, thus making it possible for the different fruit growing sections to specialize in their respective varieties, lessening competition and the reduction of prices. For example, Colorado can grow to perfection such varieties as Jonathan, Rome Beauty, Gano, Grimes Golden, and Winesap. All of these are standard commercial apples of high quality (with the possible exception of the Gano); besides they are universally known in the market, and will always command fair prices.

I would not have it understood that Colorado is limited to these varieties, for we can grow a large number of varieties besides these, in almost every portion of the State, but the public is better acquainted with the standard varieties mentioned above, and the prices obtained from them are, on the average, much higher than other less known varieties.

It is safe to say that about 40 percent of the Colorado orchards are planted to non-commercial or rather unprofitable varieties. A large share of the orchards, especially the older ones,

contain from five to twenty different varieties, but not enough of each to make car-load shipments. This fact alone greatly reduces the value and profit of the orchard. Two or three varieties are all that a commercial orchard should contain. Fewer varieties reduces the cost of production and makes it possible to give the trees the proper care. When there are many varieties, the problem of caring for the orchard becomes more difficult, as different varieties require different treatment as to pruning, irrigation, and cultivation.

The question of getting rid of the poor varieties can be solved by top grafting them to the desired variety. The loss entailed by top-grafting is relatively small, as it will only require from two to four years before the orchards are again in full bearing, and this is a much cheaper method than to dig out the old trees and plant new ones in their places.

Further, the work of top grafting can be extended over several years, so as to make the losses of crops less.

The fruit grower of the future must study every feature of an economic production of the fruit, and he must obtain the maximum crop of commercial apples from his trees if he is to succeed in his business. In fruit growing, as in any other undertaking, the success will always come to those who put the most brains and physical labor into the business. The careless and indifferent grower, the producer of poor qualities of fruit, will eventually be driven out of the business. It will entail financial losses, but ultimately fruit growing on a commercial scale will be in the hands of those who are best fitted for the work.

RECOMMENDATION

The Horticulturist feels that the present appropriation of Two Thousand Dollars per biennium is insufficient to carry out the work in the State. There is a constant call for help from the growers, which cannot be met on account of lack of funds. Our fruit growing industry represents millions of dollars in investment, which annually adds to the State's wealth, and deserves better support and encouragement than it is at present receiving. At least Five Thousand Dollars per annum should be provided, and this sum should become available automatically, so that there would be no delay in carrying on the work, as planned. Intermittent work resulting from uncertain support is in most cases a waste of public money, and if the State cannot properly support the State Horticulturist in his office, the office should be abolished.

The State Horticultural Society, one of the most essential institutions for the fruit growers, was permitted to die for want of financial aid. This institution is the best medium to knit the fruit growers together, and for the exchange of ideas and experience.

Practically all States, and most of them with insignificant horticultural interests, are supporting the State Society at a cost of from Five to Ten Thousand dollars per year. Surely Colorado, which boasts of its fruit and of its possibilities along this line, can afford to support such an institution, and support it liberally.

The fruit growers of the State have a right to demand that they be dealt with more liberally in the future than they have in the past.

