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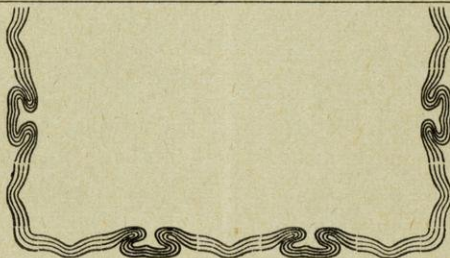
The ✧ Nebraska ✧ Bee-Keeper AND IRRIGATOR.

A MONTHLY JOURNAL DEVOTED TO APICULTURE AND IRRIGATION.

Vol. 7.

YORK, NEBRASKA, MARCH, 1896.

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Annual Report of Neb. State Bee-Keeper's Association.
Continued from February issue.

Mr. Whitcomb.—There is as much nutriment in a pound of honey as there is in four pounds of pork, and there is as much medicine in a pound of honey as there is in a fifty cent prescription, and I think if we ate four pounds of pork and then took a fifty cent prescription on top of it, it would make us sick also. We are able to give honey to people that will not make them sick by using the extractor. Perhaps you have seen sections of honey where the cells around the edge are opened. That is where the people do not use a bee escape and in using the smoker the bees tear down the capping to get at the honey, and there is some of the formic acid deposited on the rest of the honey.

Mr. Salspaugh.—You will remember two years ago my wife could not eat honey without making her sick, and now she can eat lots of it without affecting her. My son was the same way, and I think it is on account of taking it off with bee escapes.

Mr. Whitcomb.—At the World's Fair a lady said she could not eat honey without making her sick. I took occasion to take up a bottle of it to the boarding house, and explaining to her about it and I don't know but what she ate as much as any of us. We kept it there for two or three weeks and it did not make any of us sick. I don't believe there is a family within four hundred miles where honey enters into the every day diet—where it is on the table every day in the year, that pay anything to amount to anything for doctor bills. I don't believe a family can be found, barring accidents and chronic diseases where they pay anything for medicine. The people who eat lots of honey are the healthiest families in America. Now this is a strong statement, but I challenge any person to disprove it.

Mr. Stilson.—Good physicians are hunting good honey. In all the large cities you will find physicians who are making specialties of skin diseases, and these men are using immense amounts of honey. They are hunting the sweet clover honey more than anything else.

Mr. Whitcomb.—If you go to a grocery store and buy ginger snaps

that have been made perhaps six months, do you know why they are so fresh? They are made from honey. If they are made out of sugar they would be worthless in two weeks. Cakes made out of honey get moister in place of dryer as they get older. A barrel of honey in the cellar will draw enough moisture to make it ferment and sour in a little while.

Mr. Harris.—How do you make your bee escapes when you take off your honey?

Mr. Stilson.—We buy them.

(Here there was an exhibition of bee escapes by Mr. R. M. Lewis, who explained the workings of this appliance.)

Mr. Whitcomb.—I can tell if a man uses bee escapes by looking at his sections. Two bee escapes will answer for twenty colonies.

Mr. Lewis.—I have made a bee escape out of newspaper that I use in extreme cases. I take a newspaper and take a stick and cut it—bring it to a point as I would sharpen a lead pencil and punch holes in the paper, and then lay the newspaper in right over the frames, and the super will soon be cleared. Of course I only use this in extreme cases, and mostly in the old chaff hives.

Mr. Whitcomb.—They will tear it down at those places where the holes are.

The Gentleman from Illinois.—Do you pack your bees on the front?

Mr. Whitcomb.—Yes, but I leave room enough for them to fly out. I use a packing case that holds about five baskets of leaves. It is the best as it is warmer. I do not pay any attention to the snow drifts. If they are sitting along the fence where the snow drifts are, I let them go. I have had ten feet of snow over some colonies. I have thought sometimes they would smother, and when I have dug down I have found a free space as big as a barrel where the warmth of the hive had melted it. There is a little danger from sleet.

There is one thing about bee escapes. They will clog sometimes if a bee dies in them, and then the others cannot get out; or if there is a spider web in the escape the bees cannot get out and will die in the super.

Next in order came the following papers as previously arranged on the program.

THE BEGINNER. What have I Learned?

LOUIS R. LIGHTON.

In March, 1894, I became entitled to rank as a bee-keeper by purchasing three colonies of Italians, in chaff hives. I have worked with them faithfully, studying their habits, giving them the best care I knew,

and reading every item of bee literature which came within my reach—books, papers, everything. Now, after eighteen months, I am expected to tell what I have learned.

Had I undertaken this task a year ago, my paper would have been much more voluminous than the present one. My three colonies were increased last summer to eleven, and despite a small honey flow in 1894, my bees were in such splendid condition and seemed so contented and happy, and I had experienced so little difficulty or perplexity in the summer's work that I really thought I knew it all. But as my paper is written at the end of a year and a half, instead of after six month's experience, it will be quite brief.

I appreciate that I know comparatively little about bee culture; perhaps the paper would be much more interesting could I catalogue the things I want to know, and don't. There are, however, several things firmly fixed in my mind as a result of my study. The first is in reference to the proper hive to be used in scientific apiculture. I have used several sorts of hives, and have read much about many others, and have come to the conclusion that the chaff-straw-single-walled-double-walled, -one-story-two-story, -six-frame-ten-frame, -dovetailed - St. Joe-Ferguson-Aspinwall hive is the very best made, and best adapted to all climates and conditions. With such hives, you can't go wrong.

Seriously, I have made most of my own hives, getting the best of lumber obtainable on the Omaha market, and working at them in my leisure time through last winter. They are single-walled hives, and I have a plentiful supply of both second stories and supers, so that I can run for either comb or extracted honey, as the inclination strikes me. I wintered my bees in these hives, packing them outside with newspapers and straw, and allowing them to remain on their summer stands, which, by the way were pretty well sheltered from northern winds. The colonies were plentifully supplied with sugar cake, and as the winter progressed and I examined into their condition from time to time as the weather permitted; I congratulated myself on their splendid appearance. I did not lose a single bee, so far as I could see in the winter, and they all began their spring house cleaning bright and early, flying vigorously long before there was anything to be obtained in the way of pollen or honey stores. They were supplied with fresh water, salt and ground oats and corn in the bee-yard, and worked with the greatest appearance of ambition even as early as the bright warm days of February. I began to feel like a king with a good bank account, and was calculating how much wealth I would have left after making the necessary extensions to my bee yard, and laying in the added supplies apparently so soon to be required. Then I began to find dead bees on the alighting

boards, and around the hive entrances, a few feet at first, then more and more as days passed, until at last the boards and ground would be fairly hidden from view by the accumulation of dead and dying bees. Then I began to feel less and less like a king. I thought I would better abdicate my throne and go to work like a peasant.

It made me tired to look inside my shop and see the tiers of new hives, filled with frames of foundation, ready for occupancy by new colonies—colonies which might never come. My apiary looked like a representative western town in a state of total collapse after a boom, and appeared to be about as ambitionless and as full of vain regrets over wasted opportunities. Now, instead of reading the most approved methods of division, increase and queen rearing, I turned my attention to directions for uniting colonies. I found I had something to learn there, too. I united, united, and united, until at last I felt as though I would like to unite all that were left into one colony and burn that one to ashes. My new hives were standing idle; I wondered why it would not be at least decent to scoop up the dead bees with a shovel, use the new hives for family coffins, and give them Christian burial. But then, when despair was so close that I could count the separate feathers in her wing, flowers came into bloom, honey began to come in, and the country was saved.

I believe the trouble was that I began stimulation too early in the season, before my bees were in a condition to go to work. However, others lost bees in much larger proportions than I, and the cause is said to remain undiscovered. Hereafter, though, I shall see that my colonies have food enough inside their hives to supply their needs, and then I shall let them alone until spring is well opened, and they want to go to work of their own accord. That seems to be more in harmony with Nature's own ways, at any rate.

I now have seven colonies in good condition, and shall yet secure some surplus honey this fall.

One thing which I believe I have learned is that in wintering, to secure the best results, the bees need protection against dampness, more than against cold. I am taught this both by experience and by reason. Other animals succumb much more readily to the effects of cold, if exposed to dampness as well.

Another point upon which I feel well satisfied is that both in brood rearing and storing of honey, there is little difference in favor of any particular frame. Nor do I believe there to be much difference in results with any special brood chamber. Of course, plenty of room is requisite. The bees must have room for themselves, their brood and their food; but beyond that, I think the apiarist should consult his own

convenience first. Therefore, a brood chamber easily accessible, and a frame easily handled seems to me to meet all requirements. But I think a working bee should be disturbed in her work as little as possible. If the brood chamber could be reached without the necessity of causing commotion by the removal of supers or second stories, so much the better.

I have had both Carniolans and Italians. So far as I can judge from my limited experience, I prefer the Italians. I found them gentler and better workers.

Cleanliness is next to godliness wherever health is to be preserved among living creatures. It is no less so with bees than with human beings. It may seem a contradiction, but uncleanness has made angels of men and bees. My hives are kept scrupulously clean, as is my bee yard. During my spring's trouble from dwindling, I changed some of the colonies from old to new hives, supplying them with new combs or new frames of foundation, and I do not doubt that this course saved me further loss. Bees are very ready in showing their displeasure in the presence of foul odors or decaying matter. They do the best they can to cleanse their own abodes, but with little trouble the bee-keeper can do away with the necessity for their doing the work themselves, and save his little hirelings this time and labor. The bees time is honey, and honey is money.

In this neighborhood, I doubt if it is worth while to plant special crops for bee pasturage. Our basswood timber is heavy, wild flowers succeed each other closely from the beginning of spring until snow-fall, and in any season not marked by extreme drouth, the honey flow is abundant. Through this summer, I do not think there has been an interval of a day when the bees had not abundant wild pasturage.

I have not told you all that I have learned, to be sure. Perhaps I have said enough to indicate that I am firmly impressed with the necessity for continued, patient study. I have certainly learned that no man can succeed with bees, or make them succeed with him, who is not thoroughly imbued with the humble patience of a true student.

Alfalfa and Sweet Clover as Honey Producing Plants.

Address by WM. STOLEY.

GENTLEMEN BEE KEEPERS:—I have prepared no paper, but I will be glad to give you a short talk in its place. I am pleased to be able to meet you. It has been my desire to meet with you, but I have not been able to do it until now, and I had to hustle to get here by eight o'clock.

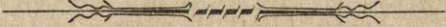
I am on the program, I understand, to say something about alfalfa and sweet clover. Both of these clovers I have been growing now for

about ten years. I have been pushing for something that would make an independent people, and that would be a honey producing as well as forage plant, and I think we have it in these two clovers. Alfalfa is the plant for bee-keepers to try and get to grow. It is not of much use to bee-keepers if it is to be used for hay, as it must be cut as soon as the bloom comes. It is about ten years since I first commenced with sweet clover. I sowed a small patch of four and a half acres, then six acres, and then I commenced sowing this seed all over every place within two miles and a half, and the result is this year my bees have done wonderfully—they have done as they never did before. I was astonished to see the honey roll in, and I was compelled to extract every third day. I believe every locality can have the same thing if the sweet clover ever gets a foothold. It does not matter what kind of weather, the drier the better, and the more honey you will have. There is one thing about sweet clover; it is hard to get the seed in large quantities. There are thousands and thousands and thousands of seeds to the plant, but how to gather it. I am at a loss there, because the seed matures as the bloom appears, and it drops to the ground while the plant is still blooming, therefore a full crop can hardly be got from the plants. I believe the best mode of getting the seed of the sweet clover is to cut it once and then let it get set, then cut it with a reaper. I believe that is the best way to do. After it has once taken root in any soil, it is very hard to get it out. After a field is once sowed it is there for always, if you want to keep it there. It is a self seeder. It is NOT such a bad weed as it is claimed to be. When I first got this sweet clover, I sowed it all over my lawn, and when it came up it was six feet high, and I thought my lawn was ruined. I was scared, but by cutting it at the proper time, I got rid of it. If you want to get rid of it, cut it just before the seed ripens. Cut it close to the ground, and you will get rid of it; that is the only way. Farmers don't like it, and one said to me, "Your sweet clover is going everywhere. It is even going into the Court House and will bring you in there." I don't care. It is not a weed at all, and the sooner the farmers realize this, the better it will be for them.

I have lots to say about this, but I have not time to say it now. I promised Mr. York, of the *American Bee Journal*, that I would write him a long article on this subject, and you will see all about it there.

The hay of the sweet clover is fine. I have lots of it at my home; I put a ton of it in a rack beside a ton of timothy and a ton of alfalfa. I turned the stock to it, and they ate the sweet clover in preference to any of the other hay. You see my cattle are educated cattle. I would rather have sweet clover hay, if it is treated right than any other kind of hay. I put sweet clover hay and alfalfa hay in my loft and between

every layer I put salt; lots of it. It helps a great deal. I have one hundred and fifty tons of it in my barns, and about fifty tons in stacks outside.



Feeding Bees With Profit.

BY G. M. WHITFORD.

My experience along this line is rather limited, and I fear any thing I may say will be of little interest or benefit to my fellow bee-keepers.

Inasmuch as the corresponding secretary has placed me on the program to respond to the above subject I will briefly give my experience during the nine years that I have been keeping bees.

My locality is a peculiar one and on the whole not first class by any means, being located several miles from timber depend entirely upon clover, fall flowers etc. for honey.

The honey flow is rather scanty except in very favorable seasons, with me it is rarely ever necessary for me to feed, the bees being able to gather nectar to support themselves at all times, with the exception of the severe drought which has occurred only twice during the time I have kept bees. However if a colony is weak in the fall they may fail to secure store enough to carry them through the winter, then it would be necessary to feed.

During the severe drought of 1894 I did not find it necessary to feed any of my 16 colonies, and when October came all had their hives well filled for winter, besides about 200 pounds of surplus comb and extracted honey.

In June just passed, I was compelled to feed some of the bees, for about ten days and made arrangements to continue as long as the bees needed feed, in less than two weeks white clover secreted as short flow of fine white honey and since have been storing some surplus, and have fitted the brood frames well for winter.

I have never thought it necessary to feed if a hive was well filled in Oct. I have always fed at evening, using the Hill tin feeder I have also used several of the Woodard, as well as the Mason jar feeders, but prefer the Hill. Granulated sugar syrup is the most satisfactory feed to use, although I have used common syrup and sorghum molasses, this latter food should be used only in the spring and summer, never in the fall or at a time when it would be left in the brood frame, and be consumed in winter.

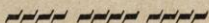
My locality is improving as to forage plants, and as sweet clover is getting a stout look for better crops of honey.

Nebraska as a Honey Producing State—Past, Present and Future Outlook.

BY E. WHITCOMB.

In the past the honey producers of Nebraska have labored against many reverses. Many of the wild flowers of our state do not produce the clearest nectar, and the march of white clover across the great prairies of our state has been greatly retarded by continued drouth. And with perhaps one exception we are but little advanced in the facilities for honey producing during the past two decades. The probabilities that alfalfa and sweet clover will become the future forage plant of our state opens up to us a brighter spot in the future for honey producing. While it is true that a great many along the eastern and northeastern border of our state have access to the Linden honey flow, yet the great mass of apiaries of our state have in the past been compelled to be content with the coarser grades of nectar. Both alfalfa and sweet clover produce a nectar of excellent quality and which will in the future command the highest price in the market. We are of the opinion that the future prospect of the apiarist in Nebraska are brightening. The past continued drouths, while they have resulted disasterously in a great many instances, are likely to prove a blessing in disguise, and place us upon a plane of better and more abundant productions than we otherwise could have hoped for.

Friend, Nebraska.



Prize Colonies—Entered in Class K. No. 1478.

Reports of surplus honey stored by single colonies, 1895.

No. 7.—Colony wintered on summer stand, in dove-tailed hive, an 8 frame, with outside winter case packed with corn chaff, with chaff bags over the cluster. 40 lbs. store.

Swarmed April 20, and May 24.

May 10 from fruit blossoms, 32 lbs. extract; June 20, 25 lbs. extract; July 18, melon honey, 40 lbs. extract; August 15, melon honey, 24 lbs. comb; August 28, Heart's Ease, 33 lbs. extract; September 11, Heart's Ease, 24 lbs. comb.

Weight of old colony Sept. 11, 52 lbs.

Total amount of comb honey, 48 lbs.

Total amount of extracted honey, 142 lbs.

Total amount of honey, 190 lbs.

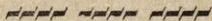
WM. JAMES.

Catched a swarm of hybrid bees June 22, 1895. Weighed 7 lbs. Hived in a single walled hive, with 11 L. frames, with full sheets of foundation, and, one sub-box with starters, weight $3\frac{1}{2}$ lbs. July 1, put on one more sub-box with starters. July 14, took out 21 lbs. of comb honey, and two brood frames—weight $8\frac{1}{2}$ lbs. and put in two more with full sheets of foundation. July 28, took out 22 lbs. of comb honey, and one brood frame—weight $3\frac{1}{2}$ lbs. and put in one with full sheet of foundation. Aug. 11, took out 20 lbs. comb honey. Sept. 1, 2 lbs. comb honey, and one brood frame—weight 4 lbs. and put in one with full sheet of foundation. Sept. 11, hive and bees one sub, weighed 71 lbs. which leaves a surplus of 121 lbs. of honey.

AUG. C. DAVIDSON.

Subscribed and sworn to before me this 17th day of September, 1895.

SAM'L. M. CROSBY, Notary Public.



The State of Nebraska. }
 County of Douglas } ss.

Richard M. Lewis being first duly sworn on oath says: That he has taken from one hive of bees one hundred forty-seven (147) pounds of surplus honey during the year 1895; that this colony went into winter quarters with about thirty pounds (30) of honey and were wintered on their summer stands in straw packing and being allowed to fly at will that in building up he gave them two brood frames of sealed honey in spring of about eight pounds, that the colony was handled by tiering up or in other words as soon as they got the surplus chamber well along and partly sealed, he raised it up and put in another section with eight empty drawn brood frames, or combs, and as fast as they finished the upper chamber it was removed and extracted, etc.

That the kind of hive used was an eight frame single wall dove-tailed hive. That the honey was extracted, and principally from basswood and white clover, with perhaps a small percentage of golden rod and autumn flowers. That the quality, in his estimation is very good, not as light colored as some, but of excellent flavor.

That one hundred and forty-seven (147) pounds is the actual amount he has taken from them to the present date, and they are still working in the surplus chamber and at the very lowest affiant thinks they can take ten pounds more from them and leave them in as good condition as when they went into winter quarters a year ago.

RICHARD M. LEWIS.

History of Colony No. 2.

Age of queen, Aug. 25th, 1894, Italian strain.

The brood chamber of hive holds 14 frames or combs $12\frac{1}{2} \times 12\frac{1}{2}$ inches outside measure, or $11\frac{3}{4} \times 11\frac{3}{4}$ inside measure; is double walled with air space. It has supers of half depth of brood chamber, and is arranged and fitted for the tiering up system. This colony was fed 20 lbs. of sugar syrup from Oct. 18 to 25, 1894, inclusive, on 8 combs, preparatory for wintering. When contracting the brood chamber, and previous to feeding, I took 6 combs containing 15 pounds of honey, packing with bags filled with oat chaff, on each end of the brood chamber, on Oct. 12th, 1894.

When ready packed for wintering, this colony had 30 lbs. of winter stores; 10 lbs. of which were natural stores. It remained on the summer stand, and was shaded in front by a shade board leaning against the hive, to prevent snow and wind blowing into the entrance. On April 26th, 1895, this colony had six combs full of brood, and strong in bees. I then enlarged the brood chamber by taking out the winter packing in one end, and adding three combs with about six pounds of honey. On May 7th I removed the rest of the side winter packing, and filled up with three more combs; one of them a drone comb with about three pounds of honey for drone rearing. All winter packing on top of brood chamber was left in the hive, consisting of cross sticks, permitting bees to pass over the frames to all stores in the hive; next a nice clean burlaps sheet spread over the entire brood chamber, next a double woolen quilt, and on top of all this a bag filled with oat chaff from five to six inches in thickness.

May 21, 1895, I fed 5lbs. of syrup (proportion, 4 parts water to 5 parts sugar) by simply pouring the feed in at the entrance at night, leaning the hive sufficiently backward for the feed not to run out of the entrance. May 23, 1895, I put on the first super, 15 combs to give more room to the bees; put on the second empty super on top of first super given, and put on the top winter packing, with the exception of the cross sticks. June 15, 1895, I removed all the top winter packing, raised the lower super, and gave second super filled with extracting comb below it. By this time, the bees needed all this room although but little honey was gathered. June 26, 1895, the queen had not only eleven combs full of brood in the chamber, but had considerable drone brood in first given super also, which I destroyed by shaving off the heads. Now I removed the drone comb given on May 7, full drone brood together with a comb containing honey, and placed this on one of the nu-

clei for queen rearing, and gave instead worker comb. Only a sprinkle of honey visible on this date in the supers.

July 12 I extracted from this colony 13 super combs, 26 lbs.; on July 15 I extracted 17 super combs, 34 lbs.; July 22, 15 combs, 30 lbs.; July 30, 16 combs, 32 lbs.; August 15, 14 combs, 28 lbs. Total, 150 lbs.

On July 22 I shaved off drone heads, and cut out queen cells, and at the same time gave a super, filled with new super frames provided with complete starters, to produce new honey. On this date I found 12 brood combs solidly filled with brood. On August 15, when I took the comb honey, I found 12 brood combs full of brood.

September 9, 1895, I found, upon investigation, that the bees had superseeded the queen. That in only four frames was capped brood, with one ripe queen cell; and one queen cell nearly ready to be capped. On this date I took 46 lbs. of extracted honey remaining in brood chamber.

[Continued in next issue.]

The Nebraska Bee Keeper

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L. D. STILSON, EDITOR.
YORK, NEBRASKA.

*Official Organ of the Nebraska State
Bee-Keepers Association.*

Entered at the postoffice as second class matter.

Officers of the North American Bee-Keepers' Association 1896:—President, A. I. Root, Medina, Ohio; Vice Pres., Wm. McEvoy, Woodburn, Ont.; Secretary, Dr. A. B. Mason, Auburndale, O.; Treasurer, W. Z. Hutchinson, Flint, Mich. The next meeting will be held at Lincoln, Neb.

Officers of the Neb. State Bee Keepers Association:—Pres., E. Whitcomb; Vice Pres., H. E. Heath, Lincoln; Sec. and Treas., L. D. Stilson, York.

Bright Red Caps.

A corps of uniformed attendants has been provided at the Chicago Passenger Station of the North-Western Line, to render both incoming and outgoing passengers all necessary assistance.

The attendants wear blue uniforms and bright red caps, and one or more of them will be found upon the station platform on the arrival of every through train; whose duty it is to assist passengers to omnibuses and street cars, and to the carriage office in the station, where arrangements can be made for carriages, coupes or cabs.

They will also carry hand baggage, assist persons in feeble health, and make themselves useful to passengers in every way in their power.

This service is entirely free, and will be found a great convenience to the traveling public, especially to ladies traveling alone or accompanied by small children.

No "tips" for attendants are necessary. They will direct you to omnibus, street car, or carriage office.

Cost of Wind Mill Irrigation Plants.

During the past month we have received inquiries from three different persons asking for information in regard to the cost of wind mill irrigation plants suitable for about five acres of land for gardens and small fruit. These inquiries are so nearly alike that we will answer them all at once.

The first consideration in estimating the cost of the plant will be to know approximately the amount of rainfall in your own locality, as a rule ten inches of water judiciously applied in addition to the rainfall is sufficient for the immediate vicinity of the Mo. River in the eastern end of the state, then add two inches more for each fifty miles as you go westward. Seasons when there is sufficient rainfall to thoroughly wet the subsoil, much less than that amount would be sufficient. But as small fruit requires a large amount of moisture it is best to prepare for at least the given amount or more for an extra dry time.

Our inquirers, one has to raise his water 10 ft. one 30 ft. and the other one 65 ft. A wind mill to pump those various depths would cost at the wholesale house in this state, for the 10 ft. well, like this, an 8 ft. back geared steel mill \$25, steel tower 30 ft. high \$20, six inch pump \$15, this mill and pump is capable of pumping water sufficient to cover an acre one inch deep in 12 to 16 hours. The same mill and 4 inch pump would require three to four days to pump the same amount of water from the 30 ft. well. This would be of sufficient capacity for the five acre garden or fruit patch. While in the first instance it would pump sufficient water for at least 15 acres or even 20 if judiciously applied the entire year, or for farm crops would be sufficient for 40 acres.

The third one of our correspondents who has to raise the water 65 ft. will have to have a stronger pump with a four or at most five inch cylinder costing about \$30, a back geared pumping steel mill costing \$50, steel tower \$35. This would finish about the same quantity of water that the 8 ft. mill would in the 30 ft. well.

In all cases a pond should be built of such dimensions as to hold sufficient water for at least an acre at a time and one with two acre capacity would be better. The cost of these is generally not large in cash out, as the farmer can do the work of building himself. We have given prices for first class materials in all cases, and if any agent or company asks more for mills and pumps to do this amount of work, he is asking you too much.

In the case of the larger mill, if the farmer wishes power to shell corn, grind feed, saw wood, or run other machinery, a geared mill can be substituted in the place of the same price, then for a small additional outlay for shafting, gearing, etc., he would have a good power for a great deal of farm work, besides running the pump.

There is one style of the jumbo mill used to some extent, but unless a man is a mechanic himself, with time and money to experiment with, our suggestion

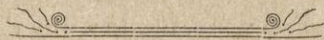
is to use something already perfected, and as they can only be used low down on the ground, they are not adapted for work where surrounded by trees or groves.

We hope we have made this explanation sufficiently plain so that others may see what plants would cost. With a person who has only used his common farm mill with a 2 or 2½ inch cylinder, he little realizes the difference in the amount of water raised by these irrigation pumps. To illustrate: A 2 inch cylinder working with a 6 inch stroke will raise approximately 180 gallons per hour, while a 4 inch cylinder working on the same length stroke and same speed would raise 800 gallons per hour, and the 6 inch cylinder working on the same length stroke and speed would raise over 1300 gallons. So that no one must for a moment think that because he has a well which is never lowered by pumping with his small cylinder that he has a well which it would answer to use for irrigation.

The most of our state is underlaid with plenty of water for all. But to get it, that's the question.

Where the depth is too great for dug wells, a wooden tubing, not less than eighteen inches, or a tube of galvanized iron can be used by boring down to water, then sand pumping the tubing down to a bed of coarse gravel. Sufficient inlets should be provided, covered with wire gauze. If the work is well done and the tubing settled to coarse gravel, such a well should supply a six inch pump with water; but even then care should be taken with a new well not to pump too fast at first, until the water has a chance to form channels, and the bottom to settle. It is better to use a smaller cylinder, or run the pump slower the first month or so than to pump the bottom out at first.

In the use of water, the same amount will go much farther the second than the first year, for two reasons. First, you will know how to use it to better advantage, and second, if well done the first year the ground will need less. Your pond will also have less seepage the second year than when new, so that a wind mill plant which can irrigate five acres the first year, can irrigate equally well seven or eight acres the second year.



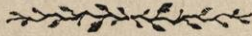
How are these for Profit?

L. A. Ganson of Lodge Pole reports that in 1894, on first backsetting, he sold from seventy square rods (ten rods less than one-half acre) vegetables to the amount of \$197, and used all he wanted for a family of six, both summer and winter. He watered with a windmill, depth of well 101 feet. He says his son is located in the the valley and uses a large pump and windmill and irrigates about seven acres, and is proportionately successful, but could not give the exact figures.

Frank X. Rihn is located on the table land sixteen miles north of Sidney.

He has an unlimited supply of water in his well, but it is 200 feet beneath the surface. He irrigated one acre last year, however. He wets the ground well in the winter when there is not much evaporation, and when his cattle do not drink so much as they do in the summer, and he says that last year he had more than \$200 worth of food products for man and beast on this one acre. He has a fine stand of small fruits, currants, gooseberries, raspberries and strawberries. These he raises by what he calls snow-bank irrigation. He has a fence around his garden which holds the snow, and his small fruits are planted by the fences. His windmill is a ten foot, but he is going to get a fourteen or sixteen foot wheel when he sells his steers next fall. This is where the money comes in—in the stock business.

It sounds well to talk or write of large yields in farm produce, but unless this produce can be marketed in the shape of beef, pork, mutton or poultry there is not much money in it.



Read this and compare with Dry Farming.

The results from gardening have been particularly satisfactory and abundant, but as I have not kept an account record, I cannot give exact figures, but upon a small tract of perhaps an acre of ground I have raised in abundance all kinds of vegetables, far excelling in size and quality any I ever saw raised under other conditions. The yield has been ample to keep the ranch supplied throughout the year with potatoes, cabbage, onions, beets and all short season vegetables, frequently supplying from twelve to fifteen different varieties at one time. The soil being mellow and fruitful, it seems as though any seed will grow, and grow luxuriantly, when furnished with proper care and a plenty of water seasonably. Irrigation seems to render one independent of the seasons in growing vegetables in this climate, as every spring and summer vegetable can be kept maturing from spring until killed by frost in the fall, with good cultivation and replanting. I know that cabbage can be made to yield, per acre 40,000 pounds; onions, 400 to 500 bushels; potatoes, 300 to 500 bushels, and other vegetables at the same ratio.

Having had but small experience in grain crops, I must speak from observation, but with equal assurance in saying that corn will yield from sixty to seventy-five bushels per acre, oats, wheat and barley from seventy-five to 100 bushels with proper attention and thorough cultivation.

These are not fancy estimates of the yield under irrigation, nor are they taken from some specially prepared tracts, but are such results as anyone can attain under this system of farming. The yield being greater, it is unnecessary to say that greater attention is required, and therefore farming should be conducted on a smaller scale to insure success, twenty to forty acres being all that one person should undertake, according to the crops planted. Irrigation does, and will continue to insure success, proportionately greater as one becomes more familiar with the proper use of water, and the time is not far distant when the application will be general throughout the country at large. John M. Adams.

Winter Irrigation.

J. W. Gregory in the Irrigation Age: It is an excellent practice to irrigate some ground thoroughly in the winter season, if you have the water, so as to have the help of the frost in mellowing and subduing the soil. It is a good thing to flood new ground that you have just prepared, if you have the water. It will show you where you need to put the finishing touches in the leveling process. Unless the ground is very moist, it is well to irrigate your ground before planting any small seed or grain. The plants come up quickly and get a good start; the seeds sprout evenly and fewer fail to come.

Having your crop once well started and kept thoroughly cultivated, further directions may be condensed in the simple admonition, water whenever it is needful. It would take columns of details to attempt to specify all the minutæ as to time, stages and conditions of growth to different crops with reference to putting on the water. Any husbandman of experience can tell when his crops need rain. Having his reservoir always full, he simply proceeds to bring on a shower whenever it is needed, and just where it is needed.

Some crops may safely be flooded, as alfalfa, the small grains, onions, etc., but with others, notably maize and Irish potatoes, it is very important that the water be kept well down in the furrows, and not allowed in any case to rise above the plants.

Most important of all, it should be borne in mind that, important as is irrigation, thorough cultivation is still more so. To soak up the ground, time after time, only to let it stand and dry out as hard as a brick, is to waste seed, water, time and labor. Thorough irrigation tends to compact the soil. Unless the surface is thoroughly stirred at the proper time, the ground, unless it is very sandy, becomes very hard, evaporation is rapid and plant growth is retarded, or even smothered out. If the ground to be irrigated is rolling, the water will necessarily be conveyed in ditches which curve about to suit the necessities of the case, and oftentimes the crops will need be planted in rows which follow the windings of the surface. If the surface to be irrigated is steeply sloping, the water must be applied along lines which run across the slope—not down it—to prevent washing out ditches and crops, and to retain the water in place long enough to allow it to sufficiently moisten the soil.



Some More Windmill Irrigation.

Mrs Kurth, who lives ten miles southeast of Sidney, on the highest point of the divide, has two windmills, and raises a fine garden. She is among the first in market with vegetables. The dry year in 1890 she had a twenty-four pound cabbage on exhibition. A few days ago she said to me: "Well, get out your book and see what I owe." "Been making a raise?" I said. "Yes, sold the steers." "How many?" I asked. "Five hundred and eighty five dollars' worth,

and they didn't cost us a cent."

Some of our eastern or southern friends might try to figure out how many bushels of corn or oats at 15 cents a bushel, or how many bushels of apples at 25 cents a bushel they would have to raise to show a net gain equal to Mrs Kurth's steers.

EDWARD M. LESLAND.

Windmill Irrigation.

Our readers may think we are cranky on this subject. Perhaps we are. We confess to having been on the losing side in the past few years at dry farming, and after studying the question from both sides, and experimenting and getting beaten every time in showing dry farming crops against irrigated farming crops, and the more we think about it, the more of a crank we get. At any rate we are putting our time and money on that side of the race, and if it is a losing one, it will be no worse than we have been doing on the other side. And if every farmer in the State would do a little experimenting for himself, using common sense in his work, Nebraska agriculture would make a wonderful advance this year. Try it.

Here is What Clarksen Says.

I want to say a word of an instance—and many of you know him well—Mr. Hershey. And I want to say to you right here that I am something of a crank in regard to my personal surroundings. I love a comfortable home; I love to go out into the yard and view nature and see the hand of an all-wise Providence in every rose bush, in every tree, in every grapevine and in every blade of grass; and I have gone to Mr. Hershey's home, and there I find the most beautiful blue grass lawn I ever set my feet upon in all my life, so heavy that when you set your feet upon it you sink clear in above the soles of your shoes, so heavy, bright and green. And there I saw his berry bushes, strawberries such as I never saw growing in my life before; and his apple trees, bless you, and every one, sir, so loaded down with the most delightful, magnificent fruit, in every respect so perfect; trees so loaded down that he had them propped up; he had to go to the lumber yard and get props to support the branches, and the lower branches resting on the ground, so great the burden of fruit they bore. That is irrigation.

Mr. Hershey can't help his trees growing. While he was sleeping every night the trees were growing; and there those magnificent trees, scarcely higher than this ceiling, were bending under the bushels of the most splendid fruit you ever saw in your life. But you can't raise fruit in Nebraska. O, no!

Well, this is the experience of one or two under a ditch which has not been constructed seven years. Will you tell me of any occupation on the face of the earth that will make a man independently rich in five years, unless some rich relative dies in the interval and leaves it to him? I don't know of any other occupation on this earth, and I have tried a good many of them, but I have found out this last chance, and I am going to try irrigation. With the opportunities for irrigation and the advantages of the locality for such irrigation right under our nose and eyes, I think we ought to accept it. I believe and consider that if the all-wise Providence had gone out to hunt for a locality especially adapted in every way for the purposes which we are here today to promote, for all the advantages which should accrue to the irrigator in this locality; the closeness of means of transportation; the productiveness of the soil; abundance of water, in a climate unsurpassed on the face of the earth; He would have settled down in the valley of the North Platte River, and would have said to Himself, "Eureka! I have found it at last! And I am going to say to my people, 'Come and settle in the valley of the North Platte River, and if you don't get independent it will be your fault, for I have done everything else for you.'"

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