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THE OLD MILL AT DELL RAPIDS, SOUTH DAKOTA
—Courtesy of the Dell Rapids Tribune.

THE KINGFISHER

O. A. Stevens

When the warmth of spring has returned and the rivers have been freed from their icy bonds, a flash of blue and a noisy rattle tells us that the kingfisher has returned to his hunting ground. How well he must know every bend of the river as he courses to and fro; every convenient limb and stub on which he can perch to await the gleam of an unwary fish. Two things are a necessity to the kingfisher, a moderately clear stream and a vertical earth bank for a nesting site. When Lewis and Clark were approaching the mountains, they noted this bird which they had not seen farther down the Missouri, and concluded that the turbid condition of the lower river made it impossible for the birds to secure food.

They are oddly proportioned birds, with large heads, small feet and short tails. The legs are short and the toes are peculiar in that the outer two are united for the greater part of their length and the hind one is small and placed far back. Another peculiarity which is not so readily observed, is that the tongue is very small. Their nesting chambers are dug for a distance of several feet into a bank, sloping somewhat upward to insure drainage. Practically no nesting material is used (sometimes a little grass), but the bones of their prey, cast out after digestion of the flesh, accumulate under and around them. The eggs are white, about one and one-third inches long, about six or eight in number. The young are quite naked at first. As Dr. A. A. Allen has the mother bird say: "As long as they are living in a hole where no one can see them, what is the use of wasting good looks?" While fish constitute their main food, various insects and other small animals are taken sometimes berries or other fruits. Mark Catesby, who was about the first to describe our species, had mentioned that it fed "not only on fish but likewise on lizards". The fish eaten are mostly minnows of no importance, though sometimes a pair of birds may locate where they secure small trout or other commercial fish. They are said to use the same burrow year after year and not to be readily fritghened away.

Why are they called kingfishers? Apparently because of their large, crested heads. Dr. Roberts says the bird "presents a rather military figure with its great double pointed helmet and serious, attentive mien". Our species is called Belted Kingfisher, a name which goes back at least as far as Alexander Wilson. This bird is found over most of North America, moving southward in winter to have open water. It is the only species of the family which occurs in our northern regions. The Texas Kingfisher of Mexico and Central America, extends north into southern Texas.

Northern Europe also has but one kingfisher, a smaller bird than the Belted, and about the same size as the Texas. It has a more brilliant blue color than our species and was rated by Hudson as "by far the most brilliantly colored bird in the British Islands". An English poet wrote of it: "It was the Rainbow gave thee

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NORTH DAKOTA STATE HORTICULTURAL SOCIETY NEWS LETTER

A. F. Yeager, Secretary, Fargo, N. D.

To get heads on your head lettuce, be sure to plant early! Any time the ground is in shape now, the seed should be put in. Delay in planting until after May first quite likely means no heads. Similar delay in planting onions from seed will cut your crop in half.

We regret to announce the passing of Mrs. W. A. Meddaugh of Westhope. Mrs. Meddaugh has been one of our most active members for many years.

If your community is staging an amateur flower show, I suggest that Extension Bulletin No. 316 on AMATEUR FLOWER SHOWS, issued by the New York State College of Agriculture, Ithaca, N. Y., would be a fine publication to have.

CONTROL BORERS OF FRUIT, FOREST AND SHADE TREES is the subject of Bulletin 373 of the Missouri Agricultural Experiment Station, Columbia, Missouri.

The suggestion has been made that the North Dakota Horticultural Society meeting be held at the time of the Annual Peace Garden picnic. If this is done, we will probably hold our formal program the day before the picnic, then the Peace Garden picnic would take the place of our usual tour. If this idea meets with your approval, or if you have objection to it, I wish you would please write. The usual time of the Peace Garden picnic is the second week in July.

The kohlrabi is a vegetable which our gardeners should try if they have not grown them before. It is a plant closely related to cabbage, best grown by sowing the seed in the garden early in May, and thinning the plants to 8 or 10 inches apart in the row. The crop should be used as soon as the swollen stems reach 2 to 2½ inches in diameter. They may be eaten raw or cooked like turnips.

Thousands of men are now engaged in an effort to wipe out the Dutch elm disease. Whether they will be successful remains to be seen, though it must be admitted previous attempts to eradicate such pests have not been any too successful. Even though the disease is not eliminated perhaps the effort will still be worth while in that it may keep the disease in control until some satisfactory remedy is worked out, or until some natural control measure makes its appearance.

A correspondent from Anamoose recently sent in a sample of peat asking whether it might be used as a substitute for manure on the garden. Deposits of peat in North Dakota are not common, but there are thousands of acres of it in Minnesota. The Minnesota Experiment Station has run tests on its use but finds that it is not an entirely satisfactory substitute for manure. Peat contains much organic matter, hence should improve the physical texture of the soil. It also contains nitrogen in abundance, but is deficient in phosphorus and particularly potash.

A correspondent from Grand Forks last year asked how to save an Arborvitae tree on which the foliage had all browned. He was advised to drench the tree with water and then keep the ground well supplied with water throughout the year. The tree is now reported to be on the road to recovery.

R. G. Adams & Co., of Columbus, Ohio, are the publishers of a new edition of FIELD MANUAL OF TREES, the price of which is $1.50. This is designed primarily for carrying in the pocket in the field for quick identification of any unknown specimen.

So-called dynamite sprays are now being used for the control of coddling moth in apples. These dynamite sprays consist of repeated heavy applications of poison close together very early in the season. They seem to be giving very much better control than the same number of applications spread over a long time.

When you are caring for your trees and shrubs, or considering the possibility of planting other things near existing trees and shrubs, it is well to remember that according to investigations made at the North Dakota Agricultural Experiment Station, the average plant of this type will have roots extending out in each direction about 1 1-3 times as far as the plant is tall. That is, a tree 30 feet tall will have roots extending out 40 feet in each direction. This distance is much greater with some kinds and less with others. A blue spruce reaches out only a comparatively short distance, while an elm or walnut extends far beyond the average.

Michigan Agricultural College reports that calcium cyanide used at the rate of one ounce per square foot will kill iris borers. In applying this material, the rhizomes should first be covered with dry sand so as to keep the chemical from coming in direct contact with them.

J. H. Stoeckeler of the U. S. Forest Service reports that running a subsoiler at a depth of about 12 inches where trees were to be planted increased the survival by 30 per cent. It also increased the speed of planting. It was found that in unsubsoiled rows trees were often cramped into too small a hole, wadded into a ball, planted shallow, or with their roots curved back to the surface. Subsoiling is particularly desirable on heavier soils.

PRESIDENT'S CORNER

F. X. Wallner
Sioux Falls, S. D.

Answering Edna, the Chicago schoolmarm, no there is no "gost" writing in the President's Corner and I did not see the wire from Emily Post, but that one was received, was stated on the menu cards. We did have a good time talking about the apples, nuts and other things we ate. I did not notice how many drank the bouillon from the cups with handles. Your pupils should enjoy the bird papers and others in our magazine. The bird papers are in every issue back to August 1931, with a few, even earlier and we hope they may continue indefinitely. Many are binding these for future reference and we hope the author will some day include all of these in what would be a most interesting book.

The author of the "Pierrescope column of the Argus Leader states that the three Olsons in the Senate are Norwegian, Swede and Danish in descent, but I think the Mr. Olsen of Viborg who was chairman of the appropriation committee is decidedly Scotch. He stated to me that he knew nothing about horticulture, that his wife was the horticulturist of the family. I looked for her during the next two hours but did not find her in her room, beauty parlor or department store, where I was directed. When I saw her, sitting at the Senator's desk, I wondered if she was the head of the house and was sorry I could not explain to her the needs of the Horticultural Society. The lobbyists certainly do not give the legislators a moments free time. The Senator that honored us with his presence at dinner had not finished his meal when two, hustled him away for an important conference. On account of the roads being blocked, we made the trip by train, arriving at Pierre at 3 A. M., and had to spend the balance of the night in chairs in the lobby, as there was not a vacant room in any of the hotels. The next morning we had to get up at 3 to catch the train and three others got our beds, for the rest of the night. Three of us occupied one small room containing one three-quarters sized bed and a cot, price $1.25 each; the hotel men should coin a little money during the 60 days the legislature is in session. The total loss of citrus fruits in California and Arizona, caused by the January freeze, is estimated at 40,000 car loads. The new tomato from the Geneva, N. Y., Station is among the heaviest yielding sorts, a cross of Ponderosa X King Humbert, and is medium early. It is designed especially for the north and is of good red, smooth fruit, good flavor and small stem end. Tests of its performance here will be awaited with interest. The first peach trees grown in California were taken there by boat, around Cape Horn from Baltimore about 80 years ago and 100 of the first peaches raised, sold for $100. The fruit of three trees sold for $300 during the flush days of the gold rush. The green pepper crop of Florida is much larger than that of last year. 132,000 bushels were harvested last year, while 660,000 bushels are expected this year. These go to the far north and Canada and all are picked in the green. Agricultural engineers at Scottsbluff, Neb, irrigated alfalfa three times, using 26.7 inches of water, sugar beets used 24.3 ins. of water during the season, potatoes 14.4 ins. and oats 14.7 ins. The oats and early potatoes required the water early, while the sugar beets and late potatoes need the water later in the season. Lawrence Elsinger brot me a few buttercup squash that were in good condition and will keep till March 1st, even tho they are not large nor were they fully matured. The buttercup squash has been classed as a fall variety, but I find it keeps well in a dry cool place, without any special treatment. The North Dakota potato show was held in Park River March 3-4 and 5 and topics of special interest to seed potato growers were discussed. Seed potato stock grown in the Park River district is very highly regarded in Iowa, Minnesota and South Dakota. In 1584 Sir Walter Raleigh obtained a grant from Queen Elizabeth "for discovering and planting with potatoes, new countries not possessed by Christians", but the prejudice against potatoes as food was widespread and long lasting, in England and Europe. Finally the "Society for the Prevention of Unwholesome Diet was formed to try and boycot potatoes, and that is where the potato got its nickname S. P. U. D. Many potato growers seem to think potatoes will be high until S. D. grown potatoes mature, but the southern growers are all increasing their plantings because of the high prices. Florida potatoes will be on the market 5 weeks earlier than last year with a bumper crop, Texas has increased plantings and will harvest a big crop. By the time Kansas potatoes reach us they will be under the dollar mark. The Italian Red Pear is a wonderful tomato to can whole as a vegetable, fruit, preserve, catsup or in any other way. Cantaloups and other melons seem to reach the far northern markets in better condition when pre-cooled or waxed, or both and more vine ripened melons are shipped from the southern fields than ever before. The Wisconsin fox farm, the largest in the world, retains special veterinarians for the care of these animals and also supervise their diet, which consists mainly of carrots, but these must be washed just as clean as for human consumption.

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FROM OUR MAILBAG

Victor Lundeen

Mrs. Arthur L. Peterson, Grand Forks, enquires if garlic is planted by seed or entirely by bulbs. Garlic is propagated almost entirely by bulbs. Seed is rarely used as the cloves or bulbets produce a more satisfactory crop.

Mr. Thomas E. Posey, Wilton, says that a solution of salt and water has been recommended to him as a desirable and effective method of controlling dandelions in lawns. We warned him that this might be a very destructive method, and that he would probably destroy both dandelions and lawn grass if he were to use it.

Mr. George Brand, Harvey, writes that he plans to clear his old grove of dead cottonwoods, then work up this ground and replant with young trees. We suggested that he select a new location for his tree planting as it is usually found that sub-soil moisture in old groves is depleted to great depths and any attempt to start a new planting in such areas usually results in failure due to a lack of necessary reserve moisture on which young trees may draw during unfavorable drought periods.

Mr. D. L. McGill, Corinth, enquires if crabapple trees grown from seed can be expected to bear fruit. We replied that if the blossoms produced are properly pollinated the trees can be expected to bear fruit. It is possible, however, that the trees are self sterile, and probably intersterile with one another. If such is the case, pollen from the blossoms of other crab or apple trees must be introduced before any fruit will result. It is usually not desirable to attempt to grow crabapples from seed. It is recommended that grafted cuttings from recognized varieties be planted if a crop of desirable quality is wanted.

A correspondent enquires is peppers can be grown successfully in North Dakota. Peppers are a warm season crop and are usually handled in much the same manner as tomatoes. If started in seedflats indoors or in the hotbed, and transplanted into the field when all danger of frost is over, peppers can be expected to grow and mature a crop before frost. Variety is important. Harris Earliest, Hungarian Thickmeat, and Sunnybrook are considered as best varieties of peppers for North Dakota planting.

A recent article which appeared in the February number of Successful Farming brought more than 500 requests for Bulletin 224, PLANTS IN THE HOME. This bulletin is now out of print and we were unable to supply all the requests received.

A new broadcast time has been assigned to the Farm and Home bulletin program. Horticultural programs may now be heard from the Fargo station on Tuesday mornings, or from the Bismarck station on Friday mornings at 7:15. If you hear these programs drop us a card or letter. We shall appreciate suggestions or criticisms in regard to these programs.

PRESIDENT'S CORNER

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Horse flesh and carrots is the main food for the fox and the three fox and mink farms in Minnehaha county are interesting places and prosperous. The one just west of my place got the top price this fall, for pup pelts, $100 each. Twenty years ago, about 40,000,000 acres were planted to feed crops for horses and mules of the country that have been replaced by the automobile, truck and tractor and we need some offset to this outgo for gas and oil, in other words we will have to grow our own fuel alcohol. On page 3 of the Jan.-Feb. "Furrow", a free magazine to the farmers by the John Deere Co., Omaha, a thrilling story of 100 years ago is started, entitled "The Blacksmith's Gift". A postal card request, will bring it to you.

The anti-smudge ordinances of California have been unworkable and unenforceable for many years past. But the smoke pall over most of California and the seacoast caused so many accidents and did so much damage that all the people not growers, want the fruit growers to throw away their 2 million old smudge pots. It is also stated that the smoke and soot was so thick that the sun's rays could not warm up the ground and was the cause of the prolonged cold spell. The approved type of orchard heater gives off very little smoke and soot and will warm the orchard more efficiently than the old type.

On Feb. 20th it was reported that there were only 3,073 car loads of onions left over, so the price skyrocketed and the growers that piled the onions up to rot, tried to salvage some and the growers that left 400 sacks per acre rot in the field because of the very low price at harvest time, are wiser now and will not be fooled again by forecasts of big crops in such an adverse season as that of 1936. The potato is another crop that was over estimated and has been the cause of big losses to growers. Cuba supplied us with 618,000 lugs of tomatoes this winter, at nearly $2.00 each, for a total of $1,260,000.

ORCHARD MANAGEMENT

L. L. Davis

The seriousness of our orchard problem is strikingly evident in the following national figures: reduction of 1,000,000 non-bearing apple trees and 6,000,000 bearing trees between the years 1930 and 1935. In the cold winters of 1933-1934 and 1934-35, approximately 3,500,000 apple trees were killed. In a survey conducted by the writer, through the cooperation of the Extension Service and County Agents in South Dakota, the following estimated data was obtained.

Total acreage in dead fruit trees	4,949
Total acreage of fruit trees in sod	5,522
Acreage of fruit trees in cultivation	2,133
Number of dead fruit trees	700,255
Total acreage of live vines	543
Total acreage of dead vines	228
Total number of dead vines	158,665

The figures are only estimates obtained by the County Agents who were assisted by local horticulturists. Practically the entire acreage in dead fruit trees is in sod. This fact should make us pause, and consider the advisability of carrying out better orchard management practices, such as cultivating the orchard, planting a cover crop, and pruning and spraying the orchard trees.

Farther south and east, it has been proven that where clean cultivation is practiced, cover crops that are not cut for hay or pastured off but plowed under in the spring are profitable. Unfortunately we do not have sufficient scientific data to prove that plowing under crops in our northern orchards will always be profitable. We do know that a cover crop prevents erosion and increases the organic matter in the soil. However, we are able to arrive at some conclusions. In an article by H. L. Lantz in The American Fruit Grower for October, 1936, he states, "Bearing Orchards which had been liberally supplied with organic matter during the past 3-5 years or more came through the drought in excellent condition and will produce marketable fruit." L. P. Batjer at Cornell Experiment Station pointed out that root killing in a large orchard was associated with a lack of organic matter and that the soil under the dead trees also contained less nitrogen than under living trees.

We do have proof that cultivation increases the amount of water retained in the soil, although cultivation may also lead to gullying or sheet erosion if some thought is not given to the time and method of cultivation. Last summer a road grader was used to cut a new grade along the State College Department of Horticulture orchard at Watertown. The surface soil was clean cultivated, and **the subsoil was moist.** On the opposite side of the road on the same soil type, there was an old sod pasture, but **the subsoil was dry.**

Soil constantly kept in fallow will wear out just the same as if it were overcropped. Nitrogen volatizes, nutrients are leached out, sheet erosion by wind or water takes place and the organic matter disappears. The United States Department of Agriculture reports that when the temperature of the soil averages more than about 75° F., humus destruction equals or exceeds the growth of new green material. When our air temperature exceeds 110° F., the soil temperature of a cultivated field must be exceedingly high and the destruction of organic matter must proceed at an alarming rate.

It is possible that the early Indians of Central America were forced to leave their thickly populated towns when the organic matter of their soils under a tropical sun was exhausted. For the above reasons it is believed that the cultivated orchard must be heavily manured year after year or it must be planted with a cover crop sometime during the month of August or early September. Rye, barley, proso, millett, Sudan grass or oats are most apt to succeed, although lack of rain may be a problem during those months.

In early spring the cover crop should be plowed under and if the terminal growth for the previous season did not average 6-10 inches, then a commercial fertilizer may be applied. Nitrate of soda (16% nitrogen) should be applied about 3 weeks before the flowers open, sulphate of ammonia (20% nitrogen) about 4 weeks, and calcium cyanamid (21% nitrogen, 70% lime) about 6 weeks before the blossoms open, although tests carried on at the Michigan Agricultural Experiment Station indicate that fall applications or cyanamid give as good if not better results as when applied in the spring, and in addition a better cover crop is obtained. The comparative cost of nitrogen in the different fertilizers will largely determine which fertilizer to use. However, in some cases, if the soil is already acid, sodium nitrate, calcium cyanamid or lime should be used to correct the excess acidity. Calcium cyanamid, if not applied early enough in the spring or used in too large quantity especially on the lighter soils, may injure the trees. Alternate bearing varieties, such as Wealthy, should receive commercial fertilizers only in the off year. No specific rules stating the amount of commercial fertilizer to use can be recommended. The grower must rely upon his experience and his observations on leaf color and size, terminal growth, health of the trees, etc., in determining the exact amount of fertilizer to use.

However, Dr. A. E. Murneek in a recent bulletin entitled, "Fertilizing Fruit Trees with Nitrogen," does give us in the following table a

good idea of the amount of nitrogen lost and consequently the amount needed yearly by a 20 year old bearing apple tree:

(Figures expressed in pounds of fertilizer containing 20-21% nitrogen).

Removed with fruit crop	2.0 lbs.
Removed by pruning	.5 lbs.
Loss from autumnal dropping of leaves	2.0 lbs.
Loss from dropping of flowers and young fruit	.3 lbs.
Required for maintenance (growth)	1.0 lbs.
	5.8 lbs.
Returned to tree from decaying flowers, fruit and leaves	1.2 lbs.
Net requirement	4.6 lbs.

This data indicates that the net requirement per tree is about ¼ pound per year of age of the tree. Some fertilizer is undobutedly lost in rain water, but non symbiotic bacteria probably add some nitrogen. It must also be remembered that in years of deficient rainfall without irrigation, fertilized trees transpire more water than unfertilized trees and thus are more subject to premature dropping of the leaves.

In our search for new fruits, let us not overlook the fact that special pruning and cultural methods will often enable us to grow some of the semi-hardy fruits and even produce larger crops on the hardy varieties. In the past, apple trees have been trained to three systems in the United States: (1) The center leader type; (2) modified leader or delayed vase type and (3) the vase type. The center leader training maintains the dominant center branch by heading back competing side branches if necessary. This is the natural growth habit of many of our apple varieties and consequently the form developed by the unpruned tree. It usually results in high crowned trees that are subject to drying winds and breakage due to the wind; it is harder to pick the fruit from such trees, and it is harder to spray the trees without expensive power sprayers. The vase type, originally practiced largely in the west, consists of the scafford branches on a short trunk arranged in the form of a vase. Light penetrates easily into the crown, but the branches have to be wired together to prevent their splitting out. The modified leader type, practiced more widely by the leading horticulturists of the middle west than any other type, consists of a vase arrangement of the upper scaffold branches while the lower scaffold branches are spaced as in the center leader type. Dr. A. F. Yeager reports a fourth system of training, ie., the trunkless apple tree. "Such trees headed at ground level have demonstrated their superiority over other types of training and are now accepted as the desired form for all trees in the variety trails at the North Dakota Agricultural Experiment Station." The system probably would not be desirable in more favored regions of the United States, but it would enable us to more successfully grow apples in the Northern Great Plains Area of the United States.

To you growers who are located in the more favored portions of South Dakota and feel you must train the trees according to the modified leader type, let me say that the one-year whip on a 2-year old root should be headed back to 34 inches from the ground to force lateral growth within 10 inches of the cut and thus obtain the first scaffold branch within two feet of the ground. There is a tendency among home orchard growers not to prune or merely rub off the buds not needed for scaffold branches. The later practice as reported by L. P. Batjer produces a large number of scaffold branches with narrow crotches, ie., limbs forming an angle of less than 40° which are likely to be weak. The lateral shoot that replaces the leader in the modified leader type should be headed back each year for 4-5 years, but should be allowed to maintain its supremecy over the lateral scaffold branches. The leaders on the scaffold branches are in turn headed back to encourage secondary branching but should not be headed back so severely that the lateral branches compete for leadership. Never leave a scaffold branch and a secondary branch on an equal footing, but favor that branch growing in an outward and slightly upward direction. All upright vigorous shoots and water sprouts are removed to encourage the development of low headed trees. After this preliminary training period of 5 or 6 years, only enough pruning is done to maintain the system by removing upright vigorous growing shoots and water sprouts on the scaffold branches or to eliminate branches rubbing against one another. Water sprouts are normally best removed after they complete their growth in July. Earlier removal tends to encourage water sprout development somewhere else.

In training the apple tree by the trunkless system, which I recommend for most home orchard growers in South Dakota, except perhaps in the irrigated area around Spearfish, the whip should be headed back to within 10-15 inches of the ground, depending upon how far the buds are apart. These lateral branches should be headed back again the next year, always remembering the fact that the effect of that cut is usually felt within 10 inches of the cut.

The trunkless apple tree system produces a bushlike tree for a few years. But as pointed out by A. F. Yeager working on Hibernal trees, after 15 years more trees will be alive, they

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SECRETARY'S CORNER

W. A. Simmons

In sending in her 1937 dues, Mrs. Louise D. Black, 1135 Walts Ave., Sioux Falls, writes; "Was rather surprised on the 28th ult, to discover that the Snowdrops planted last fall, were in bloom and evidently had been, for some days. My Grape hyacinths are up, also. Have had crocus out by March 20th, but never before an outdoor bloom in February." Evidently Mrs. Black's bulbs thot the Groundhog was spoofing.

"By a special cultural treatment, Hyacinth bulbs can be grown which will produce 6 to 10 excellent flowers on one bulb. It is rather a difficult thing to do, but when done, something really worth while has been accomplished."—Wayside Gardens, Mentor, O., catalog. The brightest spot in the office was created by a number of these bulbs in bloom. Had I not planted the bulbs myself, I would have found it difficult to believe that all of those flower stalks came from one bulb, in each pot. Of the Cluster Flowered Tulips, I have heard, not tried. These are said to produce 4, 5 or 6 good sized flowers to each bulb, all blossoming at the same time. One greenhouse grown bulb that produced nine flowers, was featured by "Believe it or not Ripley", so had there been any more, it is quite probable he would have mentioned it. Unlike the Multiflora Hyacinths, which are rather high in price, 35 cents each, the Cluster Flowered Tulips are very reasonable, from 75 cents to $1.25 per dozen. Was brot up to believe it is quite difficult to beat the Dutch and am more than ever convinced of it now.

The March issue of FARM JOURNAL contained a short but well written article about the Robertson Black Raspberry. As a result, Mr. Robertson has been receiving orders for large quantities of the plants from every corner of the Union and has been complelled to return large sums sent with same, as his stock of plants was soon exhausted. It is hoped that our other nurserymen will propagate this variety as rapidly as possible as it seems certain to become a best seller. Many favorable reports are coming in, from widely scattered sections, of the behavior of those sent out in former years. Madison Cooper, well known to most of our readers as the long time Editor of the Flower Grower, sold that publication recently and started a new one, FLOWERS AND GARDENS. The first two issues of the latter are before me, as I write and I have found them intensely interesting. Those that may miss certain features and the human touch that distinguished the old Flower Grower, will find them all in the new magazine. It is published at Calcium, N. Y., while the Flower Grower has now moved to Albany, N. Y. The price of Flowers and Gardens is but $1 per year and it is well worth it.

Mr. Gerbracht of Hettinger, N. D., presents a very interesting theory as to the cause of damping off in evergreen seedlings and his success, proves that there is a great deal of truth in it. Grass and trees do not get along well and in a natural state, are seldom found occupying the same ground. Along the edge of a forest, shrubs will usually be found occupying the front line trenches and acting as skirmishers, for the advance of the trees. Trees of any kind and especially conifers, advance with difficulty across grassed stretches of prairie, tho one can find places where it has been done in a limited way, probably by the fittest of the seedlings, where many not as robust perished. On both the Rosebud and the Pine Ridge reservations in southern South Dakota, places exist where Ponderosa pine seedlings are coming up in the prairie grass and have attained a size that shows the outcome of the struggle, is not in doubt. True, these are thin as regards stand and do not form the impenetrable thicket found in their natural habitat. Probably they are the shock troops of the advance guard, making the field safe for the advance of the main body.

THE KINGFISHER

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birth, And left thee all her lovely hues". The German name for it means "ice-bird", said to be suggested by the similarity of the color of the plumage to the glare of thick, clear ice.

Our northern birds are a rather poor representation of the family as a whole, for it contains more than two hundred species, most abundant in the eastern part of the Malay Archipelago. Many of them live away from water, feed upon insects, small reptiles or other animals and nest in hollow trees. Perhaps the most striking are the Racket-tailed Kingfishers in which the two central tail feathers are greatly elongated, and slender except at the tips. A large kingfisher of Australia and New Guinea is called the Laughing Jackass from its loud, characteristis voice. It nests in hollow trees and is said to be rather tame and inquisitive.

NEW APPLE VARIETIES

G. H. Howe

Condensed from Farm Research

Breeding new hardy fruits of all kinds has been going on at this station ever since the institution was founded. * * * During the half century that is past there have been grown at the station 13049 apple seedlings, most of them from controlled crosses.

Hundreds of parental combinations have been used. Of the total number of apple seedlings, 4569 have already fruited. From those that have come into bearing, there have been selected up to the present moment 81 kinds for further trial. Of these second test seedlings, 31 have been named and sent out for trial. Some of these new varieties have since been discarded because of obvious faults. Fourteen of them, however, are still being introduced * * *. These are Carlton, Cortland, Early McIntosh, Kendall, Lodi, Macoun, Medina, Milton, Newfane, Ogden, Orleans, Red Sauce, Sweet Delicious and Sweet McIntosh. * * *

The best known of these 14 varieties and the one most widely distributed, is Cortland, a seedling of McIntosh crossed with Ben Davis. Who has not heard of Cortland? Most orchardists now fruit it. It is known to apple buyers and is listed in all market quotations. The consumer recognizes the name, especially do those who have bot it from the roadside market or the local store and the housewife who has once used Cortland returns and asks for more. Cortland's fame has developed over a period of only 17 years, altho the variety is more than twice that age. Today Cortland is more widely known than was the well-known McIntosh after a century of culture. It is unnecessary here to discuss the merits of Cortland. All know it to be a high quality McIntosh type apple of handsome appearance and satisfactory storage quality when properly stored.

Cortland is now rated as one of the 5 leading commercial varieties for present day culture. Perhaps it might be well to name the other four, which are McIntosh, R. I. Greening, Northern Spy and Wealthy. A prominent Hudson Valley fruit grower stated to the writer last summer that without doubt 40% of the commercial orchards in that region are now planted to Cortland.

Six others of the 14 varieties now being introduced which are also seedlings of McIntosh are, Early McIntosh, Milton, Macoun, Kendall, Ogden and Sweet McIntosh. None yet has attained the extensive distribution achieved by Cortland, but all except Kendall are now fruiting in this state in notable numbers. To name the best of the six is impossible because each serves a distinct season and purpose. Macoun, Milton and Early McIntosh are well known. The latter is a summer apple suitable only for the roadside stand and the local market. The two bear prodigiously so that the fruit must be heavily thinned in order to get size. When well grown the apples are handsomely colored with McIntosh red and white, crisp, juicy flesh, carries a McIntosh flavor, altho the taste is much more tart. Growers who can grow good fruit of Early McIntosh report that they find ready sale for the apples at top prices. Without exception however, growers unite in a criticism of the variety. They say that the tree is not always an annual bearer. Careful thinning of the fruit, accompanied by proper pruning and proper culture, may correct this fault. We must not overlook a Canadian seedling of McIntosh, Melba, which ripens one week ahead of Early McIntosh and is now widely planted. Melba merits attention for the roadside stand because of its high dessert quality. The fruit is not as well colored as Early McIntosh, but growers commend it as a quick seller.

Milton, of the season of Wealthy, is very beautifully colored with pinkish red. When the trees or grafts first commence to bear, the fruit is sometimes uneven and awkward in shape. This fault becomes less noticeable as the tree assumes its bearing stride. The quality of Milton is unsurpassed for table and culinary purposes. Growers everywhere have been loud in their praise of this apple. In the Hudson Valley fruit district leading growers continue to predict that the time is not far distant when Milton will replace Wealthy in their section. On the Albany market it is a best seller in its season. Macoun ripens after McIntosh and keeps in storage longer than either McIntosh or Cortland. Well grown it is handsome in appearance with crisp, highly aromatic flesh. Growers are about equally divided in their praise and condemnation of Macoun. The chief criticism has been that the apples do not always size up well and that the trees are not always fully productive—serious faults if true. All are agreed, however, that the variety is as good as McIntosh in that intangible, undefined thing called quality. It is earnestly hoped that Macoun may measure up to the hopes of its introducers. The pride and joy of all of these apples of the McIntosh tribe is Kendall. Barring none, Kendall is the handsomest in appearance. It combines uniform size with trim graceful symmetry and a most beautiful red color. The tree likewise is sturdy, well framed and annually productive. Kendall retains its attractive finsh and the crispness and juiciness of its flesh clear until spring, in storage and when removed from storage it holds up in good condition much longer than does McIntosh. The flesh

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EVERGREENS FROM SEED

J. H. Gerbracht

Hettinger, N. Dak.

Note: This is a letter which came in response to a request that Mr. Gerbracht give us the benefit of his 20 years of experience along this line.

Answering yours about the pine and cedar seedlings. Probably this is just another case of where you should take a Dutchman by what he means and not by what he says. I didn't mean that we could raise them without work or care. What I did mean was that by following certain practices, we could raise them with as much certainty as any other tree seed. The main difficulty with evergreens is wilt. Regardless of how we varied our practices in seeding, watering, shading, fertilizing and chemicalizing the soil, they would start to droop and disappear as soon as straightened out, and keep it up until the few left were not worth bothering with.

Exasperatingly, within three hours drive, there were areas of splendid specimens up to three feet in diameter, and likely as many centuries old, thriving in such incredible situations that it would seem impossible for anything to exist there. Why wouldn't they grow for us as well as in those rocks and hardpan? One observation began to take concrete form. Where there were trees there was no grass. Where there was grass, there were no trees. Were the two mutually poisonous? Did the grass residue furnish a favorable media for the multiplication of the wilt bacteria? Was this the answer to the old, old question of why the hills and mountains are forest covered, and the prairies and plains are carpeted with grass? Well, the idea was worth trying out, anyway. We threw out the topsoil in a bed, then hunted along a ravine until we found a stratum of fine, clean sand down ten feet from the top. The bed was refilled with this, and planted with blue spruce. Boy, those spruce seedlings are delicate! Then we waited to see what would happen. Well, nothing happened. They were up in two weeks, and just kept on growing. Ninety-seven per cent of them were there until well along in the fall. Then, the inevitable ending to a true story: Busy thrashing, some curious visitor left the cover off unobserved. The day was unseasonably hot, the sand overheated, and the seedlings were a wreck. But we were satisfied anyway. The backbone theory had been sustained: **The wilt was in the soil, and other soil that was wilt free could be found to replace it.**

That clean sand had serious objections. It was too poor for satisfactory growth, dried out to a dangerous extent in two or three days, and if the top was not kept damp, it would overheat in a hot sun. Burning sands are a standby in the poetry business, but a little **de trop** in a seed bed. The next thing in order was to find out where the wilt zone began and ended. Satisfactory results were secured from the second spading. We could get soil there that was fertile, fairly heavy, and while not entirely wilt free, it was not bad enough to cause much damage. You don't miss ten or fifteen percent, and they likely are weaklings anyway. The rest is routine work, and not exciting. Some general observations may be in order. After years of work, we are giving up the growing of spruce as generally unsatisfactory. They are clearly out of their natural habitat here. Few seasons pass that they are not injured some way, and they are slow and short lived. Pines and cedars are native, and used to anything we have. We can get seed from the Bad Lands, the Slim Buttes, and the Cave Hills. Each has a different soil foundation. The Cave Hills formation is nearest like the prairie, and seed from there gives notably better results. Good seed years are few and far apart, the last being in 1928, yet there is some seed every year. The seed is ripe the first of September, and by mid-October the pine cones have begun to open and release the seed, though some remains as long as the cones are on the trees. Both pines and cedars are infested with weevils, together with a large per cent of empty and deformed seed. A reasonable seedling ratio is about ten per cent for pines, and five per cent for cedars. A half bushel of pine cones, or two quarts of cedar berries will produce 500 seedlings. Commercial seed might germinate better, but the world is waking up to the fact that trees are a little fixed in their habits, and don't appreciate joining the navy and seeing the world.

A half inch covering seems suitable, and we gage this by picking out pebbles of that size, and sifting on dirt until they are covered. Cedar berries are soaked in lye solution until the seed can be cleaned, bruising them first. Planted in the fall, covered with leaves, and forgotten the next year, except for an occacional peep to see if they are getting too dry, most of them will come the second spring, some the third and a few more will straggle along the fourth. Pines are planted in the spring and are up in a few days. Both need faithful watering while germinating, and all the first season. Pines need shade when the temperature gets around 100° F., and the cedars will stand a little more shading. Both will cook off with excessive heat and while the commercial practice is to sand the beds, we much prefer gravel screened to 1-8 to 3-8 inch size. This makes a nice mulch, does not wash in watering, and seems to be much

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NORTH DAKOTA HORTICULTURE SOUTH DAKOTA

Perhaps one of the most important problems in choosing a location for planting apple trees is to find a soil that will encourage the formation of a deep root system. This is important not only from the standpoint of nutrition but also because a deep rooted tree is better able to withstand drought than one whose root system has been restricted by unfavorable soil conditions.

—J. D. Winter in The Minnesota Horticulturist.

Blue evergreens of which there is a large number show many shades of blue, which vary by species and also by seasons and differ materially in their tones from whitish blue to deeper shades of gray. Much of the color of blue evergreens, such as the familiar blue spruce, is not a pigment in the leaf itself, but a bloom or sheen, such as we find on grapes and plums. It can be rubbed off with the fingers, and, therefore is often lost by the effect of snow and winter storms, to return again with the new growth in the spring.

—Hill's book of Evergreens.

Quoting from an investigation of lily soils, conducted by Sir Daniel Hall and M. A. H. Tincker, in the laboratories of the Royal Horticultural Society at Wisley, England, and reported in the "Lily Yearbook" of that organization for 1933, pp. 58-77: "The only general conclusion that can be drawn from these examinations is that lilies are unexpectedly tolerant of variations of acidity and lime content in the soil. For no species can it be said that it specifically requires an acid or neutral soil, the presence or the absence of lime."

If we accept this experimental work, and I think we should, the list of lilies for acid soils or limestone soils mean little or nothing.

—Dr. G. L. Slate in The Flower Grower.

Mr. E. O. Christenson, Portland, North Dokota, writes us that he has kept bees in North Dakota since the spring of 1906, having brought ten colonies into the state at that time. He reports having wintered his bees in cellars except for the past two winters, when his colonies were wintered in packing cases out-of-doors. He favors the latter method. Mr. Christenson is probably the oldest beekeeper in North Dakota.

Make a study now of vegetables and fruits which will do well in your community and plan to use them this year. Know varieties and order them from responsible and reliable seedsmen.

ORCHARD MANAGEMENT

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will have a greater mean trunk circumference at ground level, a greater mean height, a greater mean volume of head, and will yield more pounds of fruit per tree than any other training system. If desired the center can be kept open so that more light will enter and thus improve the quality of the apples borne in the inner part of the crown.

In view of work by G. L. Ricks and H. P. Gaston at Michigan Agricultural Experiment Station last year, and my own observation, I question the advisability of pruning out many

of the outside branches to get better light penetration in the mature bearing apple tree. It has been shown that the mature bearing apple tree bears 49% of the total crop on the top, 36% of the total on the outer portion of the sides, and only 15% on the inside of the tree. The top and outside bear the best apples while most of the inferior apples are produced on the inside. Why prune out branches on which this good fruit is produced, to improve the grade of the inferior apples? Why not prune bearing trees by the "Thin Wood" method, which decreases the yield of inferior fruit and increases the total yield of good fruit, instead of increasing the quality of inferior fruit and decreasing the total yield. As advocated by its authors, it "makes spraying easier and more effective, reduces sunscald hazard as compared to conventional methods, results in fewer water sprouts and consequently less fire blight, does not throw young trees out of bearing as many other methods, is adapted to bearing trees of all ages, and minimizes frost hazards."

"Thin Wood" pruning consists in removing the unproductive wood that can be recognized by four characteristics: (1) 4-year old wood of less than ¼ inch in diameter, (2) by making comparatively short terminal growth, (3) by tending to grow in a downward direction, (4) most of it is found in the lower and inner part of the tree.

To the home orchard men who must learn by experience I advise them to learn to recognize the unproductive apple branches by tagging them early in the season and then removing them the following year after it is apparent that your choice has been correct.

Cherries and plums are ordinarily pruned only enough to remove branches rubbing against one another and to maintain the shape of the tree. Pears are pruned according to the center leader type or modified leader type while apricots may be pruned to the modified leader and to the trunkless type.

NEW APPLE VARIETIES

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is sprightly with a most refreshing delectable flavor. Kendall has only just commenced to fruit in other localities but growers, and they are legion, who have seen the tree and fruit at Geneva are as enthusiastic in their praise of this apple as are the Station fruit men. Its future is awaited with a great deal of interest. Ogden and Sweet McIntosh are sweet seedlings of McIntosh. They merit but a word. Either sort is recommended for home culture. Ogden precedes McIntosh in season while Sweet McIntosh ripens with its parent, but keeps a little longer. Neither one is a variety for commercial culture.

Editors note: The McIntosh apple is recognized as being about the best flavored, of all our apples and the attempt has been made to extend the rather short season, of this variety. In the above list, some ripen earlier, while some may be kept later than the parent variety. It is believed that all of those mentioned, may be grown in this state, at least top-worked. In this connection the Maga, one of Dr. Hansen's productions should not be overlooked. Originally introduced as a crab, it has been found, when grown outside the crowded seedling orchard, to attain size enough to warrant the name of apple and it has much of the wonderful McIntosh flavor.

EVERGREENS FROM SEED

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cooler than sand. Six years will raise a pine knee high. A cedar grows as fast, but loses a year in germination. Transplanting in the field, we use a home made patent, contrived out of old cream cans with the top and bottom out, and handles on the sides. The cylinder of earth weighs about 125 pounds, and we have not yet lost a tree from the direct result of the transplanting, though that does not mean that something can't happen afterwards.