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## Scientific Stock-Feeding.

Under the direction of Prof. T. L. Haecker, the Division of Animal Husbandry at the University Farm is carrying a series of experiments which are expected one day to furnish to the stock-raisers of the Northwest an invaluable guide for the feeding of beef cattle, so as to secure the largest, most readily-progressive gain in weight on the amount of feed given, and at the smallest proportionate outlay. A system of minute observation and recording has been adopted, similar to that which, carried on for fifteen years, enabled Prof. Haecker at last to formulate a table of rations for dairy cows, the systematic use of which is today enabling dairymen to secure far greater returns, in milk and butter-fat, from cows of whatever breed, than has before been deemed practicable.

Commencing in 1907, a certain number of calves have been bought each year, and fed "from birth to block," in such a manner that the effects of different combinations of feeds are made apparent. Every mouthful of feed is carefully weighed, and the proportion of each ingredient in the day's ration noted. This work is to be carried on until the observers shall know exactly what and how much food it requires to produce a certain gain in the period from birth to any given time in the steer's life. The element of chance will thus be practically eliminated from the stock-raising industry, so far as the production of beef is concerned; to eliminate it from the marketing is another question!

One thing is already demonstrated: that the cattleman who fattens his animals "from birth to block" has a much better chance of satisfactory returns than he who sells half-grown feeders for some one else to "finish" or market. The latter turns over to the stock-yard men, to feeders and the railroads a very large share of the profits which might have been his.

"My observation, throughout the State of Minnesota, is that the man who has gone into the breeding of pure-bred live stock is the man with the best surroundings, the best buildings on his farm; he keeps his farm in the best condition—in fact, it is something which tends to develop him. In that connection I want to say that it is easier to develop a good live-stock breeder than to develop a breed. Our Minnesota farmers are beginning to learn that very thing. You can make more improvements in the breeders than you can in the breeds. I think that is one of the essential things in Minnesota. It not only tends to improve farm conditions, but it improves the man and improves his family and his home. He thinks more of himself in consequence of thinking of his stock."—L. E. Potter, Springfield, in Minnesota Stockman.

"If the farmer will put his money into good stock, fix up his home, make his surroundings beautiful and agreeable, comfortable and convenient, there is no reason why the farmer cannot have as good conditions and enjoy the comforts and conveniences of life as well as the city man; and not only that, but he is in a better and purer atmosphere; it is not contaminated with everything that is bad and unwholesome."—L. E. Potter, Springfield, in Minnesota Stockman.

"Cattle-feeding is not a hazardous business, provided it is done intelligently and conservatively. The man who feeds what he has raised on his own place, carefully husbanding the manure and puts it back onto the land, is the man who will buy his neighbor's farm in the future; while the man who hauls all he raises to the elevator is the man who sooner or later will sell his farm. I fully realize that all farmers cannot feed beef cattle, nor is it necessary that they should; but I do believe that every farmer should handle stock of some kind, grow clover, and so treat his land as to increase rather than to decrease its fertility. Cattle-feeding is merely one way of doing this; dairying is another; sheep-raising, another; and growing clover and plowing it under, still another."—Capt. W. S. Smith, Sioux City, at Minnesota Live Stock Breeders' Association.

Capt. W. S. Smith, a large stock-raiser at Sioux City, Iowa, had this to say at the recent meeting of the Minnesota Live Stock Breeders' Association, in reference to feeding once or twice a day:

"Years ago I used to feed my cattle corn twice a day, until one day I ran across Prof. Henry's book on 'Feeds and Feeding,' and there I saw the statement that many feeders fed only once a day. I had a set of scales put between two feed-yards, and in one yard fed corn once a day, and in the other twice. I weighed the cattle in both yards monthly, and found practically

no difference in gain. So for the last six years I have never fed more than once a day."—Capt. W. S. Smith, at Minnesota Live Stock Breeders' Association.

## "Half Time at School and Half Time at Work."

Under the above heading, the World's Work for April presented a very interesting description of a system of co-operative education now in vogue, under which students in the College of Engineering in the University of Cincinnati spend half their time in the hardest kind of manual labor, acquiring practical skill in every department of engineering, and the other half in the University, attending classes and doing laboratory work. They work in pairs, ten or twelve hours of the day, for eleven months of the year. One of a pair works in a shop for a week, while the other studies; then they change places and the University course of the preceding week is repeated for the benefit of the first. They are paid, in the shops, the regular wages of apprentices; the pair keeping so abreast of the work that the employer is no loser by the plan. The result is that at the end of each college term a band of thoroughly trained men are "turned out" ready for foremanships, superintendencies and other highly-paid positions; and the supply is never equal to the demand.

A similar plan has been suggested for the better equipment of the students in our College of Agriculture. Something like it has prevailed from the beginning in the School of Agriculture; the student spending six months in school and six on the farm. The College course, however, lasts for nine months, and the plan of the School could not be readily applied to the College. The question has been asked: "Why not lengthen the College term to eleven months, and have the students, working in pairs, spend each alternate fortnight in school and the other fortnight on the farm, in practical work?" The distance of the farms from the College would seem to make necessary such a variation from the Cincinnati plan of alternating every week.

The plan would seem certain to produce better farm experts than a four-years course devoted exclusively to college studies; also to insure to the State a better return for its expenditure in equipping them with a College education and fitting them for positions as instructors in Agriculture. For it would inevitably "weed out" the weaklings and the inefficient, and produce a body of instructors who could stand before the fire of the brightest body of questioning boys in the student ranks.—C. R. Barns, University Farm.

## The Bane of the Idle Acre.

Have you an idle acre on your farm? If so, why not at once put it to some use—if for no other reason, that it may work no injury to yourself or to your neighbor? Every such acre, in a settled community, is an accuser, branding its owner—so says a contemporary—"as either thoughtless, wasteful or shiftless; possibly all three." On any such acre, weeds may grow sufficient to "seed down" a township and to increase the labors of the whole farming population. The broad areas of uncultivated land, which form so large a percentage of thousands of Minnesota farms, are a standing indictment of our systems of land-ownership and taxation, as unreasonable and unjust. No man should be entitled to hold more land than he can fully cultivate or make otherwise useful to the community; as, for instance, in the growing of timber trees or in the maintenance of a well-stocked fish-pond. Idle land should be so heavily taxed that nobody could afford to keep it out of use—it must be "Cultivate or sell!" But instead of observing this just rule, we punish with heavier taxation the farmer who improves and enriches his land, and let off, with only nominal taxation, the owner of idle acres.—C. R. Barns, University Farm.

The value of farming land depends very largely on the distance from a market. A good road has the effect of shortening the time required for carrying a load of produce to market, which is practically the same thing as shortening the distance. Howard H. Gross, in the Two Harbors (Minn.) News, relates the story of a hard-headed German farmer at Sheboygan, who, in a very graphic and comprehensive way, told of the value of good roads as it appeared to him. He said: "My farm is ten miles from market. If it was only five miles from market it would be worth \$15 an acre more. I cannot move my farm in, but if we can build a good road to my farm I can come in the ten miles with my produce easier than I could come in five miles to town."

## The Examination of Minerals

Quite frequently mineral specimens are sent to the chemical laboratory for examination. These specimens are reported as being found while digging wells, making excavations for buildings, or as picked up in fields. Almost invariably the specimens are found to contain iron pyrites, or particles of mica, or small quartz crystals. Occasionally small pieces of copper, copper ore; small concretions containing manganese, iron oxide, clay and sand; and iron ores containing from 5 to 35 per cent of iron, are examined at the laboratory. In many cases a pocket magnifier shows plainly the nature of the mineral.

Iron pyrites, which are often mistaken for particles of gold, appear commonly as small cubes or twelve-sided crystals, of a brass-yellow color, too hard to be cut with a knife; the latter property as well as the color distinguishing pyrite from copper, silver and gold. There are chemical and blow-pipe tests which may be used in addition, to confirm the above; but a careful examination with a magnifier and pocket-knife are fairly conclusive, if one has a little experience.

Native copper, in pieces weighing from a fraction of an ounce to many pounds, is found in many parts of the state, having been disseminated through the glacial drift brought from the Lake Superior region. The pieces of copper may have a green incrustation of copper carbonate—malachite—which can be scraped off with a knife; the metal being copper-red and easily cut.

Particles of mica, sometimes colored a yellowish brown, mixed with sand, owing to their glistening appearance are frequently mistaken for gold or other valuable metals. An examination with a magnifier shows these particles to be in the form of plates or scales, sometimes foliated, that is, lying upon each other, like the leaves of a book.

Minnesota being almost entirely a glaciated region, there is little prospect of valuable ores of gold, silver and copper being found in sufficient quantities to pay for extraction. The greatest asset of the State of Minnesota is its soil.—G. W. Walker, University Farm.

## The Home Testing of Linseed Oils.

Use good oil for your paints. Poor linseed oil gives a poor paint. A poor paint soon becomes unsightly and gives poor protection to buildings against rain and sun. Poor protection causes rapid deterioration and calls for frequent repairs and renewals.

The Thirteenth Biennial Report of the Minnesota Dairy and Food Commission, just issued, states that one hundred out of one hundred and twenty-four samples of linseed oil examined did not comply with the state law controlling the sale of this product. Ninety of these illegal oils were found to be adulterated with mineral oil. The state inspectors confined their selection of samples largely to those oils which in their experience they have most often found adulterated. Consequently these figures indicate a higher percentage of adulterated oil than is actually to be found on the Minnesota market. It cannot be doubted, however, that there is a large amount of such oil sold.

To test your oil, place a piece of glass on a black surface, or preferably cover one side of the glass with black paint or enamel. Pour about a teaspoonful of the oil on the untreated side of the glass and hold in the direct sunlight. The presence of even small quantities of mineral oil can readily be detected by a distinct blue to green fluorescence, or play of colors, resembling somewhat the color noticeable on the surface of water when a little oil is present. Compare the appearance of the oil with a little machine oil treated similarly. Nearly all machine oils are composed principally of mineral oil, and the fluorescence will be unmistakable.

A very slight fluorescence in linseed oil is not absolute proof of adulteration, but it is a very good indication of the presence of mineral oil, and oils exhibiting it should be rejected in favor of those showing no fluorescence, or they should be accepted only after chemical analysis has shown them to be pure.

The admixture of fish oil with linseed oil can often be detected by the sense of smell. The disagreeable fish odor is especially pronounced if the oil is heated and a small amount of the warm oil is rubbed on the hands.

Other forms of linseed oil adulteration cannot be readily discovered without the aid of a chemical analysis. Fortunately, however, the use of fish oils and other seed oils for such purposes is rare.

It should be noted, in justice to Minnesota linseed oil manufacturers, that all of the adulterated samples reported by the Dairy and Food Commission, with the exception of three of unknown origin, were manufactured outside the state.—G. W. Walker, University Farm.

## Flax Wilt.

Flax wilt is caused by a mold-like fungus. The fungous threads attack the young seedling, and may either kill it outright or merely stunt its growth. The fungus may live for a number of years in the soil, on old flax straw, or on other decomposing material. It is for this reason that flax should not be grown on the same land more than once every five to seven years. The disease may also be carried on the seed. The reproductive bodies (spores) are scattered over the seed at harvest time, and remain there during the winter. In the spring, even though the flax be sown on unaffected land, the spores on the seed will germinate and infect the flax plants. There may be then two sources of infection, viz., the soil and the seed. Danger of infection from the first source may be avoided by proper crop rotation, and from the second, by seed treatment.

Seed flax should first be very thoroughly fanned, in order to get rid of all light seeds, chaff, pieces of straw, etc. Then it should be spread out on a floor or canvas, which has been previously well washed with boiling water or strong formalin solution. Spray the seed with formalin, used at the rate of 1 pound to 40 gallons of water. It is necessary to use a compressed-air sprayer, which will throw a fine, misty spray. While one man rakes or shovels the grain over, another should apply the spray, being sure to moisten every seed, without using too much of the liquid. The flax should then be covered for a couple of hours with sacking or canvas previously cleaned. It should be shoveled over, and may then be sown.

If the seed is carefully treated, and sown on land which has not grown flax for 5 to 7 years, there should be no wilt. It is important to remember that untreated seed, grown on clean land, may produce a wilt-affected crop; and, in the same way, treated seed sown on unclean land may produce a diseased crop. Therefore, great care should always be taken to get clean seed and sow it on clean land.—E. C. Stakman, University Farm.

## Valuable Books.

The Farmers' Institute Department has on hand a limited number of copies of Institute Annuals Nos. 17, 18, 19, 22 and 23. These books contain a great quantity of interesting and valuable agricultural reading. Any one wishing copies can obtain them by sending eleven cents for each book desired, to cover postage, addressing "Farmers' Institute, University Farm, St. Paul, Minn." If three or more Annuals are desired by one party, they can be sent by express.

## What is Possible.

Southwestern Washington has a little community known as Gray's River, which stands as an example of what a group of energetic farmers can do, although confronted with adverse conditions. Virtually, it is shut off from the outside world, for its only means of transportation is a small river steamer that plies the twenty miles to Astoria, Oregon, whenever the tide will permit.

These people wisely concluded that their hopes lay in marketing concentrated products, to consist almost entirely of butter, eggs, dressed veal, poultry and pork. The combination of the dairy cow, the hen and the hog has made good, and helped to build a community of contentment and prosperity.

The same forethought that guided them in the selection of products to be produced has been manifested in the advancement of their dairy industry. One finds them almost unanimous in the raising of one breed of dairy cattle. They have built up their dairy herds by the use of pure-bred sires of their chosen breed. In the purchase of sires, it has not been a question of price so much as a question of efficiency. Sires of proven merit have been exchanged within the community, and their period of usefulness thus very greatly prolonged.

In order that every cow may be made to pay a profit, many of them weigh and test the milk from each cow, and weed out the unprofitable ones. And to further add to the profit from their limited resources, and to conserve the fertility of their soil, they are growing clover and making good use of their barnyard manure.

As a result, one finds substantial and well arranged barns, comfortable homes, with many of the modern conveniences, and a contented and happy people.—O. M. Olson, Extension Division, University Farm.

## Engineers' Course.

The Short Course for Traction Engineers will open on Tuesday, May 23d, at the University Farm. It bids fair to be the most successful engineers' course yet offered. Instruction covers both steam and gasoline engine construction, operation and care, with special attention to the engines built

and equipped for plowing and threshing. Those desiring information or entrance should address the "Division of Agricultural Engineering, University Farm, St. Paul, Minnesota."

## Garden Suggestions for May and June.

BY LE ROY CADY, UNIVERSITY FARM.  
Plant a few radish seeds with slow-germinating seeds, such as parsnips, onions, etc.

One of the best shell beans to use is the Dwarf Horticultural or Cranberry bean. Sow about May 15.

Any of the vegetables may be planted by May 15 or 20, and tomatoes, peppers, etc., may be set in the garden by May 30, as a rule.

Cultivate as soon as possible after planting. A good dust-mulch on the soil is better and easier to obtain in a dry year than water.

Plant Stowell's Evergreen and Country Gentleman Sweet Corn about May 15, for main crop or fall use. Make another planting of Golden Bantam also.

Pansies are at their best in May and June. They require very rich land, and prefer a cool place, not in too strong sunlight nor exposed to the wind.

Lima beans are gaining in favor, and could well be more liberally planted. Burpee's Dwarf Lima is good. Plant in hills, just the same as other beans, about May 15.

If the sowing or patching up of a lawn has been neglected, there is still time to do it after the 20th of May. Blue grass, red-top and white clover make a good lawn seed mixture.

Geraniums, cannas and other florist stock may be planted out the latter part of May. Unless the season is very far advanced, it is usually safer not to plant coleus and other tender flowers before the 30th of May.

Give the small-fruit plantation thorough cultivation just as long as possible. When the fruit is too far advanced to be longer cultivated, put clean straw or hay between the rows, to keep down weeds and conserve moisture.

Early celery may be set into the field early in May and late celery transplanted from the seed box to a spent hotbed or well prepared plot of land. It will be ready to go to the field the last of June or early in July.

Sow Danish Ballhead and other late varieties of cabbage about May 15th. The seed may be put into well-worked beds in the open garden, either broadcast or in drills 8 or 10 inches apart and from 3/4 to 1 inch deep. It will make plants ready to transplant about the last of June.

Where land is limited, cucumbers and tomatoes may be grown on stakes or trellises. Chicken-wire is good for this, or tomatoes may be tied to stakes driven in the ground at each plant, and then all but two or three branches kept cut off, and tying those left to the stake as they grow; this results in a little less fruit per plant, but more plants may be planted on the same amount of space. Three feet apart each way is enough.

## A Good Lawn.

There is nothing that adds to the beauty of the home, more than a good blue-grass lawn. I say blue grass; for it does not matter what you seed a lawn to; it will get down to blue grass in a short time. The most essential thing is to get the ground well leveled off before seeding; for it will never become level after seeded down. The leveling is best done with a length of railroad iron; drawing it back and forth until all the low spots are filled and the rail touches the ground along its whole length. If you cannot get a railroad rail, a timber will do the work. In seeding, use at the rate of one bushel of blue grass seed to the acre; but it takes two years to get a good sod of blue grass alone. It is a good plan to sow two quarts of timothy seed with the blue grass—the blue grass will run out the timothy within a year or two. To keep the lawn in good growing condition, it should have a good coat of fertilizer applied in the fall; not disfiguring your lawn with a lot of coarse stable manure, but using fine rotted manure, or still better, pulverized sheep-manure at the rate of 500 lbs. to the acre. After sowing the seed, do not rake in but cover all over with one inch of well-rotted manure. That will not bake and become crusted, in case of hard rains, as the dirt would. The young plants will come up readily through the covering, and it will insure a good stand and a fine lawn.—A. Brackett, Excelsior, Minn.