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E. C. HUNTINGTON, Editor.

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HORTICULTURE.

EARLY POTATO BLIGHT ON EARLY VARIETIES.

Early potato blight is liable to attack the potato crop at any time from June until the crop is ripe, but is most seriously destructive in July and August. It attacks the foliage. Prof. Kohler of the Minnesota Experiment Station doubts if it will be profitable to spray early plantings of early varieties. If, however, others desire to do so he advises spraying when plants are small, and a continuance of the treatment every ten days until at least ten per cent of the leaf surface is dying, when it will be useless to spray longer. In rainy weather spraying should be more frequent. Twenty-five to thirty-five gallons of Bordeaux mixture per acre will be required for treatment when the plants are small, and as they advance in growth the amount will need increasing to fifty, sixty or seventy-five gallons per acre.

Spraying for Early Blight on late varieties of the Rural New Yorker type of potatoes has proven profitable the past two years at the Minnesota Experiment Station. Spraying late varieties of the Rural New Yorker type may be delayed until the earliest planting of early varieties in the locality shows signs of the presence of the disease, when spraying should be immediately applied at the rate of sixty to seventy-five gallons of Bordeaux mixture per acre, followed with spraying of an equal amount every ten days in good weather. In rainy weather spray more frequently.

GOOD ROADS.

PER CENT OF GRADE.

A one per cent grade on a road means a rise of one foot for each hundred feet of distance traveled up the hill. A ten per cent grade means ten feet rise in each hundred feet so traveled. A one per cent grade, then, means that in traveling up hill one mile an ascent is made of 52.8 feet, while a ten per cent grade means a rise in altitude of 528 feet in a mile. Accurate tests have shown the Minnesota Experiment Station that a horse which can pull 1,000 pounds on a level road can pull only 810 pounds on a rise of one foot in fifty, and on a rise of one foot in ten he can pull only 250 pounds. These facts show that the greatest load that can be hauled over a road is the load which can be taken up the steepest hill on that road, or through the deepest mud pole. It is therefore advised that all highways traveled by heavily loaded vehicles should be kept within a three or four per cent grade if practicable. To do this may require a change of location to get around hills, always keeping in mind that the lower the grade the larger the load may be hauled and the cost of haulage kept at the lowest point.

Good Roads For Farmers has been a subject of much study at the Minnesota Experiment Station, where it has been satisfactorily demonstrated that a fairly gratifying road for hauling heavy loads should be rounded up in the center, so that water may quickly flow into ditches at the side and be carried off through properly constructed channels. Culverts should be provided to conduct water under the roadway and thus prevent gullying the roadway with running water. When farmers learn that on each mile of highway, three rods wide, 27,000 tons of water fall annually, they will begin to appreciate the necessity of highway drainage, and learn that a hard road cannot be made out of mud. No plan of road work, no amount of labor and machinery, will make a good dirt road that will stay good until some plan is adopted to get rid of the water.

Better Profits From the Farm will come when farmers learn how to make good roads, and make them. Nothing will give them better ideas of how a good road should be built, or show them the losses they are sustaining traveling to market over poor roads, than Farmers' Bulletin No. 95, which

may be had free of cost by writing a postal card to the Department of Agriculture, Washington, D. C., and asking for it. This bulletin has been carefully studied at the Minnesota Experiment Station, with a view to better road building in Minnesota, and finds it one of the most practical helps a farmer can have in solving the transportation question in the country.

It is a Loss of Money according to reliable statistics received at the Minnesota Experiment Station for farmers to do business over roads as at present constructed in this state.

AGRICULTURE.

DEEP OR SHALLOW CULTIVATION OF CORN.

Shallow cultivation of corn, according to official experiments, seems to be most in favor at a number of state experiment stations, as opposed to deep cultivation. Deep cultivation, as understood in those states, is from three to six inches deep. Kansas is inclined to advise cultivation to a depth of from three to four inches, but not too close to the hills. In dry climates this cultivation is reported to have given better results than shallower. Over a period of five years, 1893-7, a mixture of deep and shallow cultivation gave better results in Kansas than a continuance of either system throughout the season. Much seems to depend on climatic conditions. In dry seasons a thicker dust mulch should be maintained to hold the moisture in the soil. In the early part of the season a thick mulch is not so necessary, and a medium cultivation, close to the hill, while the plants are small, may be given without danger. In July and August a heavy mulch is desirable and may be required to maintain moisture.

CROP ROTATION CLEANS LAND.

Weed eradication has long been a subject of experimentation at the Minnesota Station. Spraying with sulphate of iron has been practiced with more or less beneficial results, proving, however, a better retarder of weeds and of weed seed development than an actual exterminator. The best results in destroying weeds have come from rotation of crops, according to an article by Prof. A. D. Wilson, superintendent of the division of extension and of the Farmers' Institutes, at the Experiment Station. Two one-tenth acre plots have been cropped under differing systems of cultivation over a period of sixteen years. One plot was cropped to a five-year rotation system of corn, first year; grain, second; grass, third and fourth, and grain, fifth year. The other plot was devoted to wheat each year, the land being plowed early in the fall, carefully disced and prepared for the seed. The rotated plot is now substantially free from weeds. The wheat plot is infested with wild oats, though the station has practiced careful hand-pulling of weeds over the several years of experimentation. The two years that the rotation plot grew grass, the hay has been cut so early that weeds had no chance of maturing seed. When the plot was in corn, thorough stirring of the ground was practiced, and weeds were killed before they ripened.

The Methods Advised by the Minnesota Experiment Station of eradicating weeds by means of cultivation, has a practical illustration on the farm of Senator S. D. Works in Blue Earth county. Mr. Work's farm had been repeatedly cropped to wheat until its fertility was exhausted and the soil filled with such noxious weeds as mustard and kinghead, which abounded in such luxuriance as to make the grain crop a substantial failure. The farm was plowed about the middle of June, when mustard, kinghead, wild oats, etc., had gained great headway. After a perfect seed bed had been made, barley was sown. The ground was warm, the barley growth was so rapid as to choke the weeds. The barley was harvested in August, the ground plowed again in September, the weeds turned under. Weeds subsequently growing were killed by winter freezing, the ground was left substantially free from the common enemy to farmers, fertility has been re-established.

Many Farmers Cultivate corn with no farther object in view than killing weeds. The Minnesota Experiment Station experience proves that if no weeds appear there is just as much

need of stirring the soil as though the field were full of them. It conserves moisture, retains heat and aerates the soil. In early spring, when the soil is firm, and moisture abundant, cultivation warms the soil by decreasing evaporation. Evaporation takes heat from the soil. A mulch of mellow soil retards radiation of heat. Loosening the surface soil makes a mulch, to retain the moisture, and supplies a most favorable surface to catch and hold the rains.

Seed Corn Week, September 19 to the 24th, is to be observed throughout Minnesota in selecting seed corn for planting in 1911.

DOMESTIC ART.

NORMAL CLASS GRADUATION.

Early this month a class of eight young ladies were graduated from the normal class under Mrs. Blair, chief of the division of Domestic Art at the Minnesota Experiment Station, St. Anthony Park. Mrs. Blair gave a display of the work done by the young ladies of the normal, junior and senior classes at the reception given in honor of the normal graduates by Dean Woods. This work consisted of textiles selected by the junior class and made into a book with description of materials selected and the distinguishing features of dress goods. There was a display of work done by the freshman class showing model work and cooking outfit, together with a complete suit of under clothes, patterns for which each member of the class was taught how, and required to make. The normal class is required to make a suit of everything needed in a lady's wardrobe except tailored suits, and these garments were shown with much pleasure to all attending the reception, and to citizens of the Twin Cities following the reception.

The senior class handicraft work was displayed, showing stencils both of Japanese and original design, pottery, leather work and a book of costumes of different periods of civilization, accompanied by free hand drawings of them, and colored plates evidencing the distinguishing features of dress during those periods. Seniors are required to make a shirt waist suit and a fancy summer dress before graduating, as well as their graduating costumes. Home decoration is also a prominent part of instruction in this division. Young ladies are taught to plan and decorate the home with the least cost and with a maximum of beauty and utility. At the close of the year they each make a book of designs of homes, showing how they would decorate, drape and place pictures, etc. The instruction in this division is so important that students are very eager to take the course and make practical demonstration of it in their homes.

SULPHATE TREATMENT.

SULPHATE OF IRON AS A WEED DESTROYER.

Since the discovery of Prof. Bolly, of the North Dakota Experiment Station, that sulphate of iron will destroy many of the noxious weeds that farmers have to combat, experiments have been tried at this station with varying results. On the whole the sulphate of iron spray is proving valuable as a check, at least, to seed development of weeds, and in many instances results in killing them. According to these experiments, the weed most susceptible to the influences of the spray is wild mustard. The experiments were conducted on bright days just before the blossoming of the weed with killing effect. The effect on the leaves of grain was slight with no injury to the crop.

W. L. OSWALD,
Minnesota Experiment Station.

WEEDS A COMMON ENEMY TO PRODUCTION.

Spraying with sulphate of iron and sulphate of copper, as a means of eradicating weeds, can be said to hardly more than check their growth. The spray destroys wild mustard plants and the leaves of kinghead and Canada thistle if applied before the plants are in bloom, with a machine that will develop one hundred to one hundred twenty pounds pressure, and through nozzles which make a mist-like spray. Sprinkling with the iron sulphate solution has practically no effect. The sulphates men-

tioned are inexpensive chemicals. The machinery with which to spray a field effectively is somewhat costly. But the effect of spraying is such, if well and properly done, as to cause a material reduction of weed growth and promote a greater growth of grain. It also checks the ripening of seeds to infest the soil the following season. Many menacing weeds are not affected by the spray. Quack grass, wild oats, pigeon grass, French weed, and sow thistle appear to receive no set back from it. Chemicals that would be effective on them would be injurious to grain.

Cultivation of fields soon after harvest, which may be economically done with a disc harrow, will cause many weed seeds to germinate in the fall to be subsequently destroyed by frost. Weeds thus started may also be plowed under, where they will add to the soil fertility. Fall pasturing has proved destructive to weeds, especially where sheep have been given free range. Quick growing crops, like barley, are valuable in smothering the growth of weeds. Not needing to be sown early, barley leaves an opportunity for much dragging and cultivation after weeds have germinated in the spring. The soil thus warmed, the tender weed roots are exposed to the killing effects of atmosphere and sun, the barley germinates and grows more rapidly than the weeds, because most of the weed seeds near the surface have been caused to germinate by the early cultivation and killed by later cultivation. Barley matures earlier than weeds, and the systematic farmer may then cultivate his field, give the weeds a chance to germinate to be killed by the winter freezing or fall plowing. Winter rye is also a good crop with which to combat weeds.—A. D. Wilson, Superintendent Extension Division and Farmers' Institutes.

ENTOMOLOGY.

THE ENGLISH SPARROW.

The English sparrow is looked upon by the Minnesota state Entomologist at the Experiment Station as a menace to farmers, not only destroying grain, but also driving away useful birds. The division of entomology suggests that a very humane way of destroying them is to feed them wheat for a few mornings in the winter, in a straight line, in yard or field, and when the birds have become accustomed to the system to rake the line with a gun loaded with fine shot. Wheat, it has been said, may be soaked in whiskey and eaten by the sparrows inducing such intoxication that they may be picked up and killed. Destroying sparrows' nests several times in succession, as they were rebuilt, has discouraged nesting in the locality. Destruction by means of active poisons is not recommended by the division because the dead birds are eaten by cats, poultry, etc. The entomologist has discouraged their roosting during the winter under the eaves of his own home and defiling the building, by the use of a small collecting pistol of fine shot, shooting them off their perches at dusk.

ANIMAL HUSBANDRY.

BROOD MARES FOR PROFIT.

It is now costing the farmer about \$90.00 a year to support a horse in Minnesota, according to the statistics carefully kept at the Experiment Station. The necessity is apparent for the farmer to get into methods of handling his horses so they will return a profit, in addition to the work they do, "to pay for their board." It has been suggested by the secretary of the Minnesota Stallion Registration Board that the present average farm horses be at once converted into high class brood mares capable of raising a colt annually. The geldings should be sold to people whose business will keep them busy throughout the year and pay their owners a profit. Colts of high class brood mares will sell at the end of the second or third year for a sum sufficient to give the farmer a fair profit on his mare, while her labor will have paid him part of the cost of keeping through the idle season. The farmer needs a horse that will pay him a profit every day in the year.

The Bacon Hog, the large Improved Yorkshire, has been raised extensively at the Northeast Experiment Station at Grand Rapids, this state. This breed has proven to be the best for northern Minnesota, as it can be easily fattened on barley and peas, both of

which are successfully and abundantly raised in that part of the state.

The Minnesota Experiment Station always practices giving hogs, as well as all other animals on the farm, pure, clean water, in clean vessels. It doesn't pay to do otherwise. When forced to do so, hogs will drink filthy water—a disease breeder in them as well as in human beings. Many a running stream is contaminated by diseased animals farther up, and farmers should not rely upon streams as a water supply without knowing their purity.

Farmers Should Go Over Their Pastures and mow the spots of grass which the cattle have not eaten to insure a continued growth of grass during the summer. This practice is followed at University Farm, St. Paul, by the Animal Husbandry division. Grass not eaten on these spots soon becomes woody and unpalatable and ceases to grow. A pasture divided into two parts, each part pastured alternately, leaves much less chance for the condition described to obtain. The grass will be eaten much more uniformly in a small lot. The size of the pasture lots must be governed by the amount of stock to be fed.

VETERINARY.

Dr. Reynolds, chief of the veterinary division of the department of agriculture of this state, was one of the prominent members of the International Commission on Control of Tuberculosis Among Domestic Animals, at Ottawa, Ontario, where an extended discussion was given to the question of controlling tuberculosis among domestic animals. The question of tubercular cattle at stock shows and fairs, was one of the important features considered especially with reference to possible contact between tubercular and healthy cattle. It was agreed that managers of stock shows should give all possible encouragement to owners of healthy cattle, by offering special classes for those known to be free from tuberculosis, and such other methods as might be deemed wise. Shippers were advised to take all reasonable precaution concerning disinfection of cars before using them for cattle show shipments.

Prevention of contact between tubercular and non-tubercular cattle, in general, was also recommended as a fundamental consideration.

THE DAIRY.

Weighing and Testing Milk.—This is the only sure way to determine the difference in value between the good and inferior cow. Weighing and testing daily is only a business proposition. It is the only safe way of determining what price to ask for a cow in selling her, or of what to pay for her when buying. No intelligent farmer will sell a cow for thirty dollars that will make him a net profit of \$40 or \$50 a year. Neither will he keep a cow that doesn't pay him a profit if he knows it. Test and weigh the milk is the way to know.

Improvement in the Dairy Herd lies in better breeding, in better housing and in better feed in greater quantities. Corn fodder, clover and roots must succeed slough hay in winter, and old, weedy pastures must be broken up and sown to clover, blue grass and timothy for summer feeding. Systematic care, and feeding with only the substances which may be grown on every farm in Minnesota, is the practice at University Farm, St. Anthony Park, and is what gives the results reported from the Experiment station.

The Butter Average of the common cows in Minnesota, kept for dairy purposes, is about 160 pounds of butter annually. The dairy type of common cows at the northeast Experiment Station at Grand Rapids, under a systematic method of care and feeding, average about 250 pounds of butter annually. At University Farm, one dairy cow has averaged 325 pounds a year in a five year period. Save for a bad habit of self-milking she would easily produce 500 pounds, or more, yearly. This cow shows the value of breeding and feeding properly. The Experiment Station at St. Anthony Park, St. Paul, will send bulletins without charge to those asking for them. Write to Prof. T. L. Haecker, University Farm, St. Paul.