1-1-1944

Know and Guard Your Electrical Equipment

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Recommended Citation

Johnson, Helen Virginia (1944) "Know and Guard Your Electrical Equipment," Farm Science Reporter: Vol. 5 : No. 1 , Article 8.
Available at: http://lib.dr.iastate.edu/farmsciencereporter/vol5/iss1/8

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bean acreage should be fertilized in the Northeast Dairy area and in the Southern Pasture area, but only about 2 percent in the Eastern Livestock and Cash Grain areas and none in western Iowa.

**Use Proper Grade**

It is important that the proper grade of fertilizer\(^1\) be used so that maximum production and full use of each of the plant food elements added may be obtained. About nine different grades of fertilizer could be used on field crops in Iowa. About 268,000 tons of the fertilizer needed in Iowa should be superphosphate (20 percent \(P_2O_5\)). About 56,000 tons should contain phosphorus plus a comparatively high amount of potash such as 0-20-10, 0-20-20 or 0-9-27, about 54,000 tons should be such mixtures as 2-12-6, 3-12-12 or 4-16-4 and about 11,600 tons should contain high amounts of nitrogen such as 10-6-4 or 20-0-0. The kind of fertilizer used will depend largely on the crop and on the soil. (See the accompanying table.)

The small grain crop, which is primarily oats in which legume seedings are made, should be fertilized largely with superphosphate if the soils are average and fairly well managed. But on sandy, relatively poor or high-lime soils, 0-20-10 should be used. About half the fertilizer used on winter wheat should be superphosphate and the other half 4-16-4.

Corn needs a wider variety of grades. Slightly more than one-third of the fertilizer used on corn should be superphosphate (20 percent \(P_2O_5\)). About one-sixth used should be 0-20-10. According to Experiment Station trials, a fertilizer containing both phosphate and potash, such as 0-20-10, will give good returns on some of the more poorly drained soils of northeast Iowa and on the heavy clay-pan soils of southern Iowa. Very good results with 0-20-10 have also been obtained on the Carrington soils of northeast Iowa.

Corn grown on the high-time areas of northern Iowa usually requires a fertilizer containing some superphosphate and a considerable quantity of potash. Fertilizers such as 0-20-20 and 0-9-27 are needed for this purpose. In many parts of the state, especially in the eastern third, other grades shown in the table have been found to be beneficial. These grades, which may be 2-12-6, 3-12-12 or 4-16-4, contain a small amount of nitrogen in addition to the phosphorus and potash.

About 10,000 tons of ammonium sulfate or its equivalent (20-0-0) could be used advantageously for corn. Most of this would be used on third-year corn when previous crops have used much of the available nitrogen supply. It takes a lot of nitrogen to produce a good crop of corn, so the nitrogen fertilizer would be used to balance the plant nutrients and to guarantee that the most benefit would be obtained from any other fertilizers applied.

Our experience of the past year indicates that hemp when grown on average soils requires substantial quantities of a fertilizer high in nitrogen such as a 10-6-4 grade, while if the soils have been manured, a grade such as 4-16-4 is satisfactory.

Superphosphate should be used on permanent pastures, especially for renovation of poorer soils such as are found in southern Iowa. These pastures can be made to produce much more efficiently if fertilized and reseeded.

Rates of application will need to vary depending on the soil fertility, on the crop, on the grade of fertilizer and on the method of application. Larger amounts are used when the soils are poorer, when the concentrations are lower and when the fertilizer is drilled or broadcast rather than applied in the hill. Rates should be higher for small grain than for corn, especially when legumes are seeded, and should be still higher for alfalfa seedings, for pasture renovation and for hemp.

**Get Order in Early**

We should like to be able to tell every farmer whether he should use fertilizer and how much. But the answer is not that simple when we are talking about all areas of Iowa. If there ever was a year when farmers could afford to try fertilizer, surely this is the one. Income is good and we need to make certain every acre counts to the utmost.

The fertilizer needs we have discussed are potential needs and the fertilizer industry may not be able to supply the demand. Because of transportation, labor and storage difficulties, it will be necessary for farmers to make application early to insure delivery. When fertilizer is bought early, it is important to provide dry storage. New fertilizer distributors also should be ordered early.

We are certain that fertilizer, used in the right manner, will "back the bullets" and help many a farmer financially.

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**Know and Guard Your Electrical Equipment**

WITH THE CONVENIENCES that rural electrification has brought to farm homes in the past few years years have come added responsibilities. This is especially true in the use of electrical appliances — irons, toasters, mixers, waffle irons, sweepers and washers.

Electrical appliances in the home have been built for use under certain limiting conditions. These conditions usually are stated on the name plate or somewhere on the appliance. The information on the name plate contains either all or some of the following facts:

- **Volts:** The number of volts the appliance requires.
- **Amperes:** The number of amperes the appliance takes.
- **Horsepower:** The number of horsepowers the appliance produces.
- **Voltage:** The voltage of the electrical system in your home.
- **Frequency:** The frequency of the electrical system in your home.
- **Hertz:** The hertz of the electrical system in your home.

Electrical appliances in the home usually are stated on the name plate or somewhere on the appliance. The information on the name plate contains either all or some of the following facts:

1. The grade of fertilizer refers to the percentage composition of the material. According to law, the content of each plant food element must be stated on each label. Such figures as 0-20-5, 0-20-10, 3-12-6, etc., refer to the percentage composition; thus, a 10-2-6 grade contains 10 percent available phosphoric acid (P\(_2\)O\(_5\)), 2 percent available potassium (K\(_2\)O), and 6 percent water soluble potash (K\(_2\)O).
formation on the voltage supplied by your power plant can be obtained by calling the company.

An electric iron marked for use on a 120 volt circuit will not heat as rapidly to capacity on a 110 volt supply, and will slow down the ironing job. When an appliance built for a certain voltage must be used where the voltage is lower, the heating element could be short­ened, allowing more heat to develop in the iron.

If the converse were true — a toaster built for 110 volts being used on 120 volts — more watts (heat) would be developed, and the toaster would burn out sooner. In addition, the toast would probably burn most of the time.

**Electric Clock**

Electric clocks are built for certain frequencies (cycles). Of the three frequencies — 60, 50 and 25 cycles — developed by power companies, 60 is by far the most common. The number of cycles per second determines the time keeping of the clock so if the clock isn’t operating on the proper frequency, it won’t keep time correctly. The wrong frequency also is harmful to the clock.

Another example of the effect of lowered voltage on heating appliances is sometimes seen when home appliances are connected to outlets by means of extension cords. The extension cord increases the resistance through which the current has to travel with the result that less current reaches the appliance. Frequently appliances are plugged into circuits intended only for electric lights. Such circuits would be wired with smaller wire than that used in appliance circuits. Since a fine wire offers much greater resistance to the flow of electricity than does a heavy wire, the too fine wire on a circuit, plus the lengthening of the wire by means of extension cords, causes a considerable drop in voltage on the line. That means too few volts are actually applied to an appliance requiring high heat.

Irons or roasters connected by an extension cord to a light circuit might make a dangerous fire hazard. Ordinarily, so large a load on the line would blow the fuses. But sometimes this is prevented by an oversized fuse. A light circuit needs a 15 ampere fuse with No. 14 wire. Putting in a fuse of high amperage when a large number of appliances are to be used is exceedingly dangerous, for overheated wires may cause a fire. It also causes some loss of power on the line to the appliances. Furthermore, the appliances themselves do not perform properly. Heat appliances will not get hot enough.

**Know Your Fuse**

There is more to be said about the matter of blowing fuses. Fuses are made of critical materials that must be conserved. A fuse prevents fires by blowing when wires get overloaded and become heated. If there were no fuse to blow, the wires of the circuit probably would melt, or the wires in the appliances might melt. The appliance or circuit would then be useless. If a combustible material were near the hot wires of the circuit, a fire would result.

A fuse will blow when the line has too many appliances on it, or when a “short” circuit develops. In the case of a short circuit, the current going through the line becomes tremendously large, because the resistance has become exceedingly small.

To determine how many outlets are on a single circuit, remove one fuse; then turn on all the lights and appliances in the house. Adding up the amperes of all those that are “blacked out” will give the total load on the circuit. Each appliance and each light bulb tells how much power (watts) each uses. The light bulbs tell indirectly:

- 200 Watt bulb — 1.67 amps.
- 150 Watt bulb — 1.25 amps.
- 100 Watt bulb — .83 amps.
- 60 Watt bulb — .50 amps.

The appliances, on the other hand, will have the number of amperes of current that each uses printed directly on the name plate or somewhere on the hot normally have been converted into heat. Instead, it goes directly back to the power house, developing heat on the line and thus blowing the fuse.

Since most “shorts” are caused by worn cords or plugs, it is a good idea for homemakers to know what to do about them. While plugs and cords differ somewhat in their actual construction, they are alike fundamentally. There must be a path for the electricity to leave the main line and come into the cord through the wall plug. Then there must be a path for it to leave the cord and go into the appliance through the appliance plug. When it has gone through the appliance, there must be a complete way for its return to the main line again. This means, then, a path into the appliance and a path out of it. At no time should it be possible for the electricity to jump from the incoming
path to the outgoing path without going through the appliance.

If two bare wires are rubbing, they may be insulated from each other by wrapping each with friction tape. If the electricity is jumping from one path to the other within the plug, the plug can easily be taken apart and studied. First, one must note that the two paths are separate. Sometimes just a little wisp of wire may be touching the other side. Within the plug, especially in an iron plug, there are little grooves where the wires should be. There are always two screws or terminals in every plug to which the wires of the cord are attached. The wire ends should be twisted and fastened to these — one screw is meant for each electrical path.

The greatest difficulty is to put the wire around the screw properly. This can be done most easily and efficiently as shown in the accompanying illustration.

Finer, Better Lime, Please

(Continued from page 15)

In our study of the 182 limestones obtained from different parts of the state, we found that they averaged 83.0 percent C. C. E. The 25 poorest samples, however, averaged only 64.3 percent whereas the 25 best samples averaged 96.3 percent equivalent. Because of this difference in neutralizing value it would take exactly 3 tons of the poorest to be equal to 2 tons of the best.

Conclusions

The marked demand for and the rapid increase in the use of limestone during the past few years probably accounts for the tendency toward a lowering of standards. This is unfortunate at the present time. We need to increase the amount of limestone used on Iowa farms, but we also need to get the greatest returns possible in terms of bushels of corn and tons of alfalfa from every ton of limestone used.

The bottlenecks in production are largely due to shortages of labor and transportation. It takes the same amount of labor and transportation facilities to produce and haul limestone that is of high quality and quickly available in the soil. Moreover, the particles of limestone that are so coarse that they remain in the soil practically unchanged for several years are making little contribution to food production and the war effort.

Our slogan for the present war production program should be “Use more limestone of better quality to maximize food production.”

Oat Seeding Rate

With the price of seed oats high and a large demand for oats to feed, Iowa farmers may well consider carefully the amount of oats per acre that they sow next spring.

Some information on rate of seeding — its effect on yield, lodging, date of ripening and the like — has been obtained during the past 2 years in experiments conducted by the Iowa Station on the Agronomy Farm at Ames.

Tama oats have been seeded on Clarion and Webster soils during those 2 years at rates of seeding ranging from 1 bushel to the acre to 4½ bushels. In 1942, the best yield was obtained from a seeding rate of 2½ bushels to the acre. In 1943 the best rate was 3 bushels.

From the tests during these 2 years, it appears that there is no advantage in seeding more than 3 bushels to the acre.

In both years there seemed to be no connection between the rate of seeding and the height the oats grew, how they stood up or lodged. There seemed to be no connection in 1942 between the rate of seeding and bushel weight of the oats harvested, but in 1943, in a less favorable growing season (for some reason which is not known), the bushel weight increased from 30 pounds at the 1½-bushel rate to 34 pounds for the 4½-bushel rate.

In 1943 the yield per acre from 1 bushel of seed was 68 bushels to the acre and for the other rates as follows: 1½ bushels of seed — 70 bushel yield; 2 bushels — 72 bushels to the acre; 2½ bushels — 74; 3 bushels — 76; 3½ bushels — 76; 4 bushels — 74; 4½ bushels — 73.

In 1942 there was no increase in yield from seedings of 2½ bushels to the acre up to 4½ bushels. In fact, as in 1943, the yield dropped off from seeding rates higher than 2½ bushels to the acre.

New Seedling Potato

A new seedling potato named Sequoya has been developed and introduced by the United States Department of Agriculture which appears to have a lot of resistance to injury by leaf hopper.

If such a variety adapted to Iowa can be found, it will be a great improvement over the varieties we have now, for it will eliminate most of the four or five sprays that are necessary to avoid hopper injury.

The Sequoya, Irish Cobbler and Early Ohio were planted adjoining a bean patch to insure plenty of hoppers in a field test by the Iowa Station in Iowa last year. Except for one spray with lead arsenate to control potato bugs, the potatoes were left unsprayed throughout the season. The foliage of the Sequoya remained green with scarcely a suggestion of hopper burn while the Cobblers and Ohios were severely burned.

Sequoya yields well in northern Iowa and is an attractive potato. But it matures 2 to 3 weeks later than the Cobbler which is a serious objection.

Further crosses between the Sequoya and an earlier variety will be made in the coming year with the hope of combining immunity to hopper burn and early maturity.

Rate to Plant Soybeans

If you plant soybeans in rows about 32 inches apart, then the rate of seeding for maximum yields with seed of high germination need not be more than 1 bushel to the acre.

This is the conclusion reached after 4 years of testing five varieties of soybeans seeded at rates ranging from 0.6 bushel to 2.2 bushels to the acre. In these tests conducted on the Agronomy Farm of the Iowa Station at Ames, the yields from the different rates varied only slightly, up to seeding rates of 1.8 and 2.2 bushels to the acre. These heavier rates gave significantly lower yields.

(The heavier rates of seeding also showed more lodging. In 1942 with the early frost, the badly lodged beans were damaged more than those that stood up well because lodging retarded maturity. Therefore, too heavy rate of seeding soybeans may cut down the quality as well as the yield.)