production (FCM) increased slightly in 8 of 9 cows when changed from sunchoke to corn silage. The increase was associated with a higher total digestible nutrient intake on the corn silage ration.

The need for investigating the digestibility of sunchoke ensiled at a less mature stage was pointed out.—S. T. DEXTER, C. W. DUNCAN, and C. F. HUFFMAN, Professors of Farm Crops, Agricultural Chemistry, and Dairy, respectively.

LITERATURE CITED

IMPROVEMENTS IN THE BIRD-CONTROL APPARATUS FOR EXPERIMENTAL PLOTS

Numerous bird-control apparatuses have been built by workers in North America. All have reported excellent success in bird control. This apparatus was first described by Pfeifer. 2

Further use of the apparatus has induced development of several technical changes to improve its operation. A 15,000 volt, 30 to 60 milliampere neon-sign transformer is satisfactory for operation of the perch. The original publication should be corrected to this specification.

Specifications: It is recommended that at least a 15,000 volt transformer be used. If good control can be obtained by shocking and without killing the birds, a 15 or 30 milliampere transformer is satisfactory. If more than 2,000 feet of perch line are built, a 60 milliampere transformer is recommended.

Improvements: This season a 110-volt electric outlet was used to supply voltage to the transformer rather than a small gasoline engine-operated generator. This permitted the use of a time clock in series with the apparatus and eliminated the need of early arising to start the generator.

The 110-volt supply presented a difficulty that was not foreseen. This supply provides an unlimited source of amperage concerning the rating of the transformer. As the perch wires arc, the transformer is essentially shorted, and severe overload conditions occur within the transformer.

This did not occur when the gasoline generator was used, as it lacked sufficient amperage supply to overload the transformer. Thus a simple, lasting current-limiting device was designed to protect the transformer (schematic diagram in figure 1). The wiring of incandescent light bulbs in series with the primary of the transformer will prevent the overload of the transformer. If the total wattage of the light bulbs is one-half the rated wattage or volt-ampere rating of the transformer, the balance of voltage and current supply appears adequate. This prevents the transformer from operating at more than one-half its rated value. When the perch wires are not arcing, the bulbs should be only slightly glowing or not lit. When arcing occurs, the transformer will draw more current through the bulbs. The lighted bulbs in turn reduce the voltage and limit the current supply to the transformer, thus preventing overload within the transformer.

In 1956, 562 kilowatts of electricity were used to operate the apparatus for one month from 4:30 a.m. to 8:00 p.m. The protected plot was 4 acres. The perch wires were built around the perimeter of the field, and complete control was obtained. Reports from other workers indicate that height of the perch wires over the crop is not critical. One perch wire was built more than 20 feet above the ground and operated with complete efficiency. High voltage lines must be out of range of human touch.

Best quality of insulation must be used in the high voltage circuits of the perch. Consider using only glass or glazed insulators. Other insulation fails under humid conditions and destroys the effectiveness of the apparatus. Refer to the original publication for these specifications.—ROBERT P. PFEIFER, Associate Agronomist, University of Wyoming, Laramie, Wyoming.