otherwise mortality is high and ratios rendered unreliable.

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"ALFALFA YELLOWS"

In a recent issue of Science (78: 385–386) there appeared an article under the title of "Alfalfa Yellows"[1] which reported that the simple agronomic procedure of deferring the cutting of the first crop of alfalfa until it showed abundant blossoming, or from June 9 to June 21, had proved during the past season to be an effective remedy for preventing the stunting and yellowing of alfalfa caused primarily by leafhoppers, *Empoasca fabae* (Harris). It is not the purpose of this note to minimize the value of this observation, which applied to Wisconsin conditions, but to report some of the results of our five years' studies on this problem—one that is of the utmost importance to growers of alfalfa in the northeastern part of the United States.

As a result of these studies some significant leads have been obtained on the control of this injury by varying the cutting schedule of alfalfa. However, in the latitude of Arlington Experiment Farm near Washington, D. C., and of Columbus, Ohio, the problem of control of this injury by cutting is much more complicated than the writers of the recent article in Science infer. Experiments over a period of years will be required to permit specific recommendations for control of this injury by altering the regular cutting schedules of alfalfa, and it is probable that the recommendations will vary according to conditions in different localities. It was generally true during 1933 that where the first crop was not cut until 10 or more days after the usual date the more serious injury to the crop following this delayed cutting did not appear. This, however, is not always the case. From the standpoint of the insect alone many factors enter into the problem of controlling by a cutting schedule the extreme losses to alfalfa by this leafhopper. Each year at Arlington Experiment Farm, from May 10 to 16 until July 1 or later, there appears to be a continuous and general migration of this species into alfalfa, after which special periods of migration take place as potatoes or other favored hosts become less attractive as food plants. Of more importance to this phase of the problem is the fact that this leafhopper, under the most favorable environmental conditions of weather and food plants, can build up its populations to tremendous proportions within a comparatively short time. It seems fairly certain, therefore, that the period of ideally favorable environmental conditions for the development of this leafhopper, combined with the amount of migration from nearby maturing or harvested crops or from more distant areas, as well as the stage of growth at which the crop is attacked, are extremely important factors in determining the amount of injury to alfalfa that will be caused at any one time by *E. fabae*. The importance of all these factors must be taken into consideration and their influence determined before any cutting schedule for alfalfa is adopted for controlling the injuries caused by *E. fabae*.

[1] It is preferable to refer to this disease-like injury caused by *Empoasca fabae* (Harris) as potato-leafhopper-injury, since the term "yellows" carries the inference that a virus or bacterial disease is involved, and also because various shades of pink and red as well as yellow colors are usually present.

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EXPERIMENT ON THE EFFECT OF FATIGUE IN INSOLATION

One factor in the effect of insolation on rock exfoliation has not yet been determined. That is the fatigue due to repeated temperature changes acting over a period of centuries. An experiment designed to test this factor was begun at Ohio State University in 1932 by the author in cooperation with Mr. Alfred Holmberg and is being continued at Harvard University. A block of coarse-grained granite, polished in the quarry, is being subjected to alternating periods of heating and cooling, repeated ninety-six times a day. A temperature change of about 120° F. is induced in the surface of the rock. Thus, the effect of exposure to insolation for one century in an arid climate is accomplished in a little more than a year in the laboratory. The effect should be much greater than would be true in nature because of the rapidity of the heating and cooling. Photomicrographs of the specimen are taken at intervals as the experiment progresses, providing an accurate record of the position and size of surface cracks. Cooling is accomplished by a current of dry air, so that the effects of water are avoided.

The rock has already been subjected to changes in temperature corresponding to a period of more than a century with extremely small effect. A slight development of cracks along cleavages in the feldspar is the only observed change. Present plans are to continue the experiment for a number of years (corresponding to centuries) in an attempt to measure quantitatively the factor of fatigue over a time interval which will be comparable to those in which the break-up of rocks is accomplished in nature.

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