

Weather Bureau Technical News

SPECIAL SLIDE RULE FOR COMPUTING EVAPOTRANSPIRATION

In response to the need for a rapid and accurate method of making daily computations of evapotranspiration from forage crops, a special slide rule has been developed by L. T. Pierce, Weather Bureau State Climatologist in Columbus, Ohio, and G. H. Snyder, Student Trainee in 1959 and 1960 at the Weather Bureau Office in Columbus. Use of this special rule, which incorporates a moderately complex empirical formula, has cut the time consumed in making numerous daily calculations by at least 50 percent of that formerly required when using a conventional slide rule or desk calculator. At the same time it has reduced the chance of error and eye strain from constant reference to tables.

This particular slide rule was designed for use in computing "actual" evapotranspiration from established meadow crops in Ohio and adjacent areas through use only of the commonly available daily temperature and rainfall data. It is intended for current use as a device for keeping track of changes in soil moisture, and also for reconstructing the probable moisture conditions prevailing in past years. An adaptation of the same type of empirical formula

is now being developed for use with other common crops such as corn and wheat; and computations for these crops can be made on the same slide rule by substituting appropriate scales. Other workers in meteorology and related fields might well find this kind of tool very useful for making routine computations involving empirical formulae. In several respects, the special slide rule is preferable to the commonly-used nomogram, especially when large numbers of computations are required.

A full description of this rule, with particular emphasis on the procedures employed in its development, is given in a paper by L. T. Pierce and G. H. Snyder, "Development and Use of a Special Slide Rule for Computing Meadow Evapotranspiration," which is available as a Weather Bureau "printed manuscript" from the Publications Section, U.S. Weather Bureau, Washington 25, D.C. This paper, which contains full-size scales for use in constructing a duplicate of the original rule, is a "how-to-do-it" type of presentation that makes it relatively easy to adapt the procedures to other uses.