

## Book review

S. Perrenoud, 1977. Potassium and Plant Health. IPI Research Topics No. 3. International Potash Institute, Worblaufen-Bern, Switzerland. 218 pp., 147 tables and 59 figures, and an index of parasite names. Paper back, Price SF 13 (US \$ 8.65).

After the 12th Colloquium of the International Potash Institute in Turkey (1976) 'Fertilizer Use and Plant Health', a survey of the literature was prepared on the effects of potassium on plant health. Of the fifteen chapters, five deal with the effect on viruses (VI), on bacterial and fungal diseases (VII), on nematodes (V), on insects and mites (IV), whereas only one (X) describes the effect on growth and yield of crops. Perrenoud found only three investigations where yield response was compared in healthy and infested plants. So it is difficult to distinguish between the effect of K on parasite development and on damage to the host caused by the infestation. In the short chapter (IX) on the nature of potassium effects, a number of suggestions are made on the effect of a limited supply to the plant, but it is left to the reader what to think of large dressings, which will certainly not be the opposite of insufficient K supply. Little or nothing seems to be known.

Whether potassium affects resistance or merely growth, it generally reduces damage by pests and diseases. Perrenoud remarks that the nitrogen-potassium ratio is crucial.

Regardless of the curative effect on infested plants, different pests and diseases obviously react differently to an increased supply. Potassium decreased fungal and bacterial diseases in 70% of the trials reviewed, particularly in forage crops and rice with the unexplained exception of rice blast (*Pyricularia oryzae*).

The effects on viruses and nematodes are less clear; they often increase and not decrease. Potassium does not seem to alter the population density of nematodes, but may stimulate growth by increasing the root system of the hosts. The relationship between virus development and potassium is discussed for potatoes, while the information on other crops is only tabulated.

Insects and mites are discussed as one group. From the tables, potassium depressed insects in 78% of the trials reviewed and mites in only 44%. As the nutritional requirements of mites differ from those of insects and potassium affects protein metabolism of the host, an explanation could lie in the availability of amino compounds. Perrenoud does not elaborate on this.

Much of the usefulness of treatment depends on the magnitude of the effect to be expected. In many tables, the effects are described by the signs + or -, indicating a decrease or increase in parasite development. Only Chapter I gives some data on the magnitude of some effects. Therefore, the author's main conclusion that 'potassium tends to improve plant health' should be read twice to understand that it does not say 'potassium inhibits diseases and pests'. This last conclusion the reader is unable to draw after reading the book, which in its present form is more a collection of tables than a study.

The book does not give a complete answer to the question; What is the relationship between potassium and plant health? But it does stimulate interest in the relationship between host plant physiology and the development of diseases and pests. In the most important tables 142 to 147 (on green paper), the diseases and pests are listed alphabetically with their host plants, effect (if possible also magnitude), kind of trial, formulation of fertilizer and reference. This makes the book a valuable guide to those working on integrated control or studying relationships between host plants and parasites. Chapter XII gives recommendations for future work.

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