

Book review

F. Müller, 1986. *Phytopharmakologie: Verhalten und Wirkungsweise von Pflanzenschutzmitteln*. Eugen Ulmer, Stuttgart. In German, with 96 figures and 7 tables, 228 pp., ISBN 3-8001-3069-6. Price: DM 48.00

The author of this book is involved in herbicide research and is the coordinator of the 'Phytopharmakologie' working party of the German Phytomedicinal Society. The book starts by defining 'phytopharmacology' as a branch of crop protection, between the disciplines of physics, chemistry and biology on one hand, and the agricultural sciences on the other hand. It includes the behaviour, mode of action, metabolism and side-effects of pesticides.

There are five chapters. Each chapter starts with information on pesticides in general followed, except in Chapter 1, by sections on herbicides, insecticides and fungicides.

Chapter 1 describes retention of pesticides and mechanisms of penetration and absorption. For this purpose, the morphology, anatomy and function of the plant, leaves (epidermis, cuticle, cell-wall, plasmalemma and stomata) and roots are comprehensively treated and illustrated.

Chapter 2 is on translocation of pesticides in plants. Symplastic, apoplastic and mixed symplastic-apoplastic transport are mentioned. Intracellular, short-distance and long-distance transport are treated separately.

Chapter 3 is the most comprehensive and deals with pesticide metabolism in plants. General principles of degradation are presented, including oxidation, hydroxylation, reduction and conjugation reactions. The metabolism of herbicides is treated according to the chemical groups to which they belong. The sections on insecticides and on fungicides are smaller than those on herbicides.

Chapter 4 concisely explains modes of action of pesticides in plants. The effects of herbicides on the following processes are treated: photosynthesis; respiration; synthesis of carotenoids, lipids, amino acids and proteins; and auxin metabolism. Most insecticides, fungicides, acaricides and nematocides now available are intended not to interfere with plant metabolism. Consequently, not much attention has been paid to their effects on plants.

In Chapter 5, a few pages are devoted to non-target effects of pesticides on crop plants. In a concluding remark, the author states that crop protection will become part of an integrated system. To make this possible, much information about pesticides will be required, e.g. mode of action, behaviour, and factors affecting activity and selectivity of pesticides. It is the task of 'phytopharmacology' to provide this information. The book concludes with a limited number of references and an extensive subject index.

The book does not deal with mode of action of pesticides, it describes actions of pesticides *on and in plants*. Thus, modes of action of herbicides are treated, whereas those of insecticides in insects and those of fungicides in fungi are not. There are a few minor defects. It is not logical to include asymmetric triazines under the heading 's-Triazine'; it is short-sighted to mention only degradation of herbicides as a cause for selective action, as is done in Chapter 3 for a few examples.

The book is up-to-date. It is very well illustrated and shows more than 600 molecular formulae. The text is suitable for advanced students in agricultural, biological and crop production sciences and is very valuable for all who are professionally involved in crop protection.

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