Production Practices and Quality Assessment of Food Crops

Volume 2

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Plant Mineral Nutrition and Pesticide Management

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PREFACE

Plants require nutrients in order to grow, develop and complete their life cycle. Mineral fertilizers, and hence the fertilizer industry, constitute one of the most important keys to the world food supplies. There is growing concern about the safety and quality of food. Carbon, hydrogen and oxygen, which, together with nitrogen, form the structural matter in plants, are freely available from air and water. Nitrogen, phosphorus and potassium, on the other hand, may not be present in quantities or forms sufficient to support plant growth. In this case, the absence of these nutrients constitutes a limiting factor. The supply of nutrients to the plants should be balanced in order to maximise the efficiency of the individual nutrients so that these meet the needs of the particular crop and soil type. For example, it should be noted that EU-wide regulations are not designed to govern the specific details of mineral fertilizer use. Although plants receive a natural supply of nitrogen, phosphorus and potassium from organic matter and soil minerals, this is not usually sufficient to satisfy the demands of crop plants. The supply of nutrients must therefore be supplemented with fertilizers, both to meet the requirements of crops during periods of plant growth and to replenish soil reserves after the crop has been harvested.

Pesticides are important in modern farming and will remain indispensable for the foreseeable future. Without them it would be practically impossible to produce the enormous quantities of food that are required to feed the world's growing population. Multi-residue analysis of pesticides is applied routinely in food control laboratories around the world, especially in the control of fruits, vegetables, and cereals, since they are generally produced using direct applications of pesticides. Technical aspects of the application of pesticides and other agricultural inputs are in many countries of the world neglected and on field level unknown. Studies have shown convincingly that most farmers in developing countries can not handle highly hazardous pesticides in an acceptable manner. European Proficiency Tests 1996/97 (incurred pepper and spiked apple), Swedish NFA Inter-calibration Test 1995 (incurred grapes), and Spanish MAFF Inter-laboratory Tests 1994/95/96 (spiked and incurred peppers, and incurred lettuces). Pesticides must be applied with utmost care in the most efficient manner to protect crops and farm animals, while leaving the lowest possible residues in food and the environment. The Joint FAO/WHO Meeting on Pesticide Residues (JMPR) has, since its inception in 1963, updated on a regular basis the scientific principles and methods by which it assesses pesticides. However, its operating procedures and resources have remained static despite the huge increase in work load associated with the evaluation of pesticides today compared to the time of its inception forty years ago.

Nine chapters are included in this book, which are: Environmental and Biological Monitoring of Exposure to Pesticides in occupationally Exposed Subjects; Crop Quality Under Adverse Conditions: Importance of determining the Nutritional Status; Phosphorus Management in French Bean (*Phaseolus vulgaris* L.); Nutrition and Calcium Fertilization of Apple Trees Diagnosis, Prediction and Control of Boron Deficiency in Olive Trees; Boron-Calcium Relationship in Biological Nitrogen

Fixation Under Physiological and Salt-Stressing Conditions; Lime-Induced Iron Chlorosis in Fruit Trees; Si in Horticultural Industry; Biological Monitoring of Exposure to pesticides in the General Population (Non-Occupationally Exposed to Pesticides).

In this book, we will cover various aspects on mineral nutrition, fertilizers and pesticide management to improve agricultural production, yield and to amelioration of soil fertility. The production of good quality food can not be achieved without the strict control of the quality and the use of pesticides. There is a need to increase research and development facilities to focus on new product development, seeking solutions to environmental problems and making more efficient use of applied nutrients and pesticides.

The editors wish to express their sincere gratitude to all authors for their valuable contributions. We are grateful to Kluwer Academic Publishers for giving us an opportunity to compile this book.

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