



**EFFICIENT
USE OF
FERTILIZERS**



EFFICIENT USE OF FERTILIZERS

Revised and Enlarged Edition

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NOTE TO REVISED AND ENLARGED EDITION

For this new edition of *Efficient Use of Fertilizers* extensive changes have been made in the monograph as originally published in 1949 (No. 9 in the series of FAO Agricultural Studies) and much new material has been incorporated. The eight chapters of the original edition have been increased to eleven chapters in the new edition. Two new chapters have been added, one dealing with crops and their soil and nutrient needs and the other with the economic aspects of fertilizer use. In the first edition the use of fertilizers, manures and soil amendments formed the subject of one chapter; this material is now presented in two chapters.

The first four chapters in the new edition correspond as to subject matter with the same chapters of the first edition. Chapters 5 and 6 of the new edition present the topics covered by chapter 5 in the old edition but in greater detail. Chapters 7 and 8 of the new edition are enlarged versions of chapters 6 and 7 of the first edition. Chapter 9, "Crops - Their Soil and Nutrient Needs" and Chapter 10, "Do Fertilizers Pay?" are newly written. Chapter 11 is a revised version of chapter 8 of the first edition. The most important differences between the first and second editions of this monograph are given below by chapters:

Chapter 1. The text has been brought up to date.

Chapter 2. Additional material has been presented especially on the removal of nutrients from the soil by animal and crop production, on plant nutrient intake and on the effect of some nutrient elements on the intake of others.

Chapter 3. This has been extensively revised, the section on compost has been particularly enlarged with special reference to city waste.

Chapter 4. Additional information is given on the power requirements of some fertilizer manufacturing processes, on solubility of fertilizer materials, on the use of anhydrous and aqueous ammonia and ammonium solutions, on fertilizer legislation and on recent developments and trends in fertilizer materials and mixed fertilizers.

Chapter 5. All the main factors concerning soil, climatic conditions, crops, systems of farming and fertilizer characteristics which

influence the efficient use of fertilizers are presented in much greater detail.

Chapter 6. Time and method of application are discussed and additional topics, such as top dressing by aircraft, application of anhydrous ammonia and liquid fertilizers, deep placement of nitrogen fertilizer for wet paddy and foliar application of fertilizers are also dealt with in this chapter.

Chapter 7. This covers crop sequence and has largely been rewritten. This chapter includes a great deal of new material particularly in regard to farming practices in different countries.

Chapter 8. Plant relationships to soil regions are discussed. This chapter has also been rewritten to include a historic review of soil use, an evaluation of world soil resources and a discussion of the soil fertility of the Broad Soil Groups.

Chapter 9. This new chapter discusses thirty-one major world crops, their physical soil requirements, their nutrient demands, their widest distribution and general fertilizer needs.

Chapter 10. Another new chapter in which farm economic and public policy aspects of fertilizer use are discussed in detail.

Chapter 11. The farmer and the agricultural services are dealt with. New examples have been included on how farmers are helped in different countries with their soil fertility and fertilizer problems and the value of simple fertilizer tests on cultivators' fields.

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FAO intends to bring out further editions of this monograph and would be grateful for any corrections and additions which would then be of use.

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