## CONTENTS

1 - BOTANICAL CHARACTERISTICS 11

2 - ORIGINS AND VARIETIES 15
   2.1 - Classification of cut Roses 15

3 - GENETIC IMPROVEMENTS AND SELECTION OF NEW VARIETIES 19
   3.1 - AIMS 19
   3.2 - BREEDING AND SELECTION 20
   3.3 - ROSE'S GENETIC 24
   3.4 - MUTATIONS OR “SPORTS” 24

4 - ROSE PROPAGATION 25
   4.1 - CUTTING PROPAGATION 27
   4.2 - STENTLING (Grafting) PROPAGATION 30
   4.3 - DORMANT EYE-GRAFTING (BUDDING) 34
   4.4 - TISSUE CULTURE 40
   4.5 - PROPAGATION PHYSIOLOGY 40
   4.6 - PROPAGATION OF THE ROOTSTOCK 41
   4.7 - PRINCIPAL ROOTSTOCKS 42
   4.8 - VEGETATIVE AND ROOTING HORMONES 45
   4.9 - PROPAGATION OF THE GROWING MEDIA 46
   4.10 - ROYALTIES 47

5 - GREENHOUSES AND INSTALLATIONS 49
   5.1 - GENERAL CHARACTERISTICS OF GREENHOUSES IN THE MAJOR ROSES PRODUCTION COUNTRIES 50
   5.2 - GREENHOUSES 53
   5.3 - INSTALLATIONS 56
      5.3.1 - EXTERNAL SHADING 57
      5.3.2 - INTERNAL INSULATING SYSTEM 58
      5.3.3 - VENTILATION 58
      5.3.4 - COOLING AND FOG SYSTEM 60
      5.3.5 - CARBON DIOXIDE SYSTEM 61
      5.3.6 - HEATING SYSTEM 63
      5.3.7 - ASSIMILATION LIGHTING SYSTEM 63
      5.3.8 - SULPHUR EVAPORATORS SYSTEM 65
      5.3.9 - IRRIGATION SYSTEM 65

6 - ENVIRONMENTAL PARAMETERS 69
   6.1 - CLIMATE AND TEMPERATURE 69
      6.1.1 - DESCRIPTION OF CLIMATE CONDITIONS OF PRINCIPAL ROSE PRODUCING COUNTRIES 70
   6.2 - TRANSPERSION 74
   6.3 - PHOTOSYNTHESIS 76
   6.4 - RESPIRATION 78
   6.5 - CARBONIC FERTILIZATION (CO₂) 78
   6.6 - COLOUR 79

7 - QUALITY OF IRRIGATION WATER AND NUTRIENT ELEMENTS 81
   7.1 - THE QUALITY OF THE WATER 81
   7.2 - NUTRITIVE ELEMENTS 85
      7.2.1 - MACRO-ELEMENTS 86
      7.2.2 - MAIN-ELEMENTS 87
      7.2.3 - MICRO-ELEMENTS 88

8 - SOIL-BASED CULTIVATION 93
   8.1 - SOIL PREPARATION 94
      8.1.2 - ORGANIC AND MINERAL FERTILIZATION OF BASE OR BASE DRESSING 96
      8.1.3 - FERTILIZATION DURING CULTIVATION, OR COVERAGE OR TOP DRESSING 98
   8.2 - VOLUMES AND FREQUENCY OF IRRIGATION 101
   8.3 - ROSE CULTIVATION IN THE PRINCIPAL COUNTRIES 103

9 - SOIL-LESS CULTIVATION (OPEN CYCLE SYSTEMS) 121
   9.1 - CHARACTERISTICS OF GROWING MEDIUM 122
      9.1.1 - PHYSICAL CHARACTERISTICS OF THE GROWING MEDIUM 123
      9.1.2 - CHEMICAL CHARACTERISTICS OF THE GROWING MEDIUM 124
   9.2 - GROWING MEDIUM CHOICE 124
      9.2.1 - INORGANIC GROWING MEDIUM 124
      9.2.2 - ORGANIC GROWING MEDIUM 127
   9.3 - SYSTEMS AND TECHNIQUES OF SOIL-LESS CULTIVATION 129
      9.3.1 - CULTIVATION SYSTEMS ON ROCKWOOL AND OTHER INORGANIC MEDIUM 130
      9.3.2 - CULTIVATION SYSTEM ON COCOPEAT AND OTHER ORGANIC MEDIUM 144