

Chapter 8 - Plant and forest biotechnology

81 Introduction

- A. Agriculture
- B. Population
- C. Green revolution
 - 1. past versus future
- D. Size

82 Plant biotechnology

- 1. photosynthesis
- 2. historical plant manipulation
 - a. artificial selection
 - b. traditional breeding
- 3. artificial mutations
- 4. genetic manipulation

A. Clonal propagation

- 1. callus tissue
- 2. production products
 - a. 2° metabolites
 - b. recombinant protein
- 3. micropropagation
 - a. uses
- 4. treatment of plant cells
- 5. protoplast formation

B. Plant genetic engineering

- a. problem
- 1. Ti plasmid
 - a. plasmid
 - b. problem
- 2. alternate gene entry techniques
 - a. gene gun
 - b. electroporation
 - c. silicon carbide crystals
- 3. antisense genes
- 4. what genetic engineering provides
- 5. improvements

C. Improved resistance to specific herbicides

- 1. goals
- 2. GMHT
- 3. herbicides
 - a. glyphosate
 - b. glufosinate
- 4. GMHT crop effect on environment

D. Improved resistance to insect pests and microbial diseases

- 1. chemical pesticides
- 2. biological control
 - a. problems
- 3. Bt
- 4. viral resistance
- 5. results

E.Improved post-harvest characteristics

- 1.problems
- 2.cause
- 3.tomato
 - a. Flavr Savr
- 4.targets

F.Transgenic crops worldwide

- 1.where and what modified
- 2.biofortification
 - a. golden rice 2
- 3.regulatory approval costs

G.Pharming: pharmaceutical crops

- 1.definition
- 2.expectations
- 3.stages
- 4.stage
- 5.target drug
- 6.problems & solutions

83 Forest biotechnology

- A.Why do
- B.Acid rain
- C.Research amounts
- D.Tissue culture technology
- E.Targets for change
- F.Hurdles
- G.Solutions
- H.Trees as energy crops
 - 1.coppice crops
 - 2.giant grasses
 - 3.cellulose crops
 - 4.white rot fungi