

## INDEX

### Symbols

1-methylcyclopropene 55, 90, 91, 92  
 $\alpha$ -tocopherol 46, 79

### A

ABA 40, 42, 50, 52, 79, 87, 91, 150, 153, 155  
abiotic stress 5, 27, 34, 149, 150, 153, 154, 155, 156  
abscisic acid 40, 42, 50, 87, 97, 150, 153  
abscission 3, 4, 8, 16, 38, 50, 56, 76, 118, 151, 153  
adenosine triphosphate 8, 39, 119  
aetiology 130  
air temperature 25, 86, 92, 94  
anther 5, 8, 29, 31, 34, 88  
  dehiscence 5, 34, 88  
  indehiscence 5  
anthesis 4, 5, 6, 8, 10, 87, 88, 150  
anthocyanin 79  
antioxidant enzyme 10, 12, 15, 17, 150, 154  
aquaporin 150  
ascorbate peroxidase 46, 47  
ATPase 114, 115, 151  
axial resistance 100, 106

### B

begomoviruses 125, 127, 128, 130, 131, 132, 133, 134, 135, 137, 138, 139, 140  
*Bemisia tabaci* 125, 140  
biodiversity 149  
biomass 2, 52, 55, 78, 149  
biotechnology 149, 153  
boll  
  development 1, 2, 10, 17, 50, 76, 101  
  number 16, 50, 77, 129  
  retention 4, 6, 8, 16, 18, 50, 55  
  size 16, 17  
boric acid 115, 119

boron 113, 114, 115, 116, 117, 118, 119  
  deficiency 113, 114, 115, 116, 117, 119  
  mobility 113, 115  
  tolerance 119  
  toxicity 113, 115, 118, 119  
  transport 115, 119  
  transporter 119

### C

C3 53, 76, 86  
  metabolism 86  
C4  
  metabolism 86  
calcium 10, 11, 12, 17  
cambium 117  
  cambial layer 97  
canopy 13, 17, 42, 45, 47, 52, 53, 54, 55, 76, 77, 86, 91  
  temperature 13, 47, 55, 86  
carbohydrate 4, 6, 8, 10, 16, 42, 43, 44, 46, 52, 53, 55, 56, 76, 91, 114, 116, 117, 118, 150  
  metabolism 44, 46, 150  
  non-structural carbohydrates 117, 118  
  transport 118  
carbon fixation 39, 101  
carbon monoxide 88, 89  
cell  
  division 118, 119  
  expansion 11, 37, 89, 150  
  wall 11, 38, 114, 116, 117, 118, 119, 149, 150, 151, 152, 153  
cellulose synthesis 150, 152, 153  
channels 115, 116, 152  
chlorophyll 4, 10, 15, 41, 118  
chloroplasts 38, 43, 44, 47, 49  
circadian rhythms 93  
climate change 1, 149  
climateric fruit 87  
competitive pollination 33, 34

controlled environments 43, 85, 102  
cool temperature 153, 186  
cotton  
  crop productivity 1, 37, 39, 82, 110,  
    149, 153  
  fiber 52, 127, 150, 151, 152, 153, 155, 156  
  production 55, 56, 90, 113, 125, 130,  
    131, 138, 140  
cultivar  
  commercial 14, 15, 48, 101, 106, 156  
  heat-tolerant 8  
  modern 15  
  obsolete 15, 18  
cytokinins 97  
cytoplasm 26, 49

## D

dark period 93  
dark respiration 4, 43  
deep root 99, 105  
deficiency 42, 113, 114, 115, 116, 117, 119  
deficiency symptom 114, 116  
dehydration resistance 29  
desiccation  
  response protein 150  
  tolerance 101, 155  
diploid species 137  
disease 104, 125, 127, 128, 129, 130, 131,  
  132, 134, 135, 137, 138, 139, 140  
  symptom 125, 130, 134, 135  
DNA 125, 130, 132, 133, 134, 135, 137, 140  
dominant genes 138  
drip system 98  
drought 37, 38, 40, 41, 42, 44, 46, 47, 48,  
  50, 52, 53, 54, 55, 56, 82, 87, 90,  
  91, 92, 94, 100, 101, 105, 106, 149,  
  154, 155, 157  
  tolerance 47, 52, 53, 54, 55, 56, 100,  
    101, 106  
dry matter production 2, 52, 91, 99

## E

electromagnetic radiation spectrum 73, 82  
elevated CO<sub>2</sub> 78, 153  
elongation 6, 26, 37, 38, 48, 77, 89, 90,  
  91, 92, 94, 102, 104, 117, 149, 150,  
  151, 152, 153  
  stage 151  
emergence 3, 78, 98, 102, 104, 125, 138  
energy reserves 8  
environmental signals 94  
enzymatic reactions 37, 152  
Ethephon 87  
ethylene synthesis 87  
evaporative  
  cooling 86, 92  
  demand 2, 37, 117  
exotic accession 106  
exotic cotton 102, 105, 106  
extra-floral nectaries 117

## F

far-red light 73, 82  
fauna 97  
fertilization 1, 5, 6, 8, 10, 13, 16, 17, 54, 119  
  efficiency 6, 8, 10  
fiber  
  elongation 151, 152, 153  
  initiation 149, 150  
  length 51, 52, 77, 153  
  quality 52, 56, 76, 114, 153, 154  
fibers 5, 16, 52, 78, 117, 151  
first flower 4  
first square 4  
floral  
  buds 4, 16, 46  
  development 17  
  initiation 13  
  structures 3  
flowering 1, 4, 5, 6, 8, 13, 15, 16, 17, 44,  
  47, 50, 51, 52, 76, 114, 117  
  period 6, 15, 16, 17

## foliar

- B application 116
- diagnosis 113, 118
- fertilization 119

## fruiting

- branches 3, 129
- sites 3, 4, 118

## G

- gametophyte 5, 6, 8, 17
- geminiviral 125, 127, 129, 131, 133, 135, 137, 139
- geminiviruses 125, 130, 132, 134, 137, 139, 140
- gene expression 150, 152, 153, 155
- genetic
  - diversity 27, 34, 101, 154
  - potential 25, 105, 153
  - variability 27, 34, 55, 98, 106, 119
- genotype 6, 37, 42, 43, 45, 53, 55, 79, 101, 105, 106, 138
  - thermotolerance 8, 10, 12, 14, 15, 17, 25
- germination 1, 3, 5, 6, 8, 10, 17, 26, 27, 28, 29, 30, 31, 33, 34, 50, 73, 104, 114, 155
- germplasm 15, 25
- gibberellins 97
- global warming 14
- glutathione reductase 12, 13, 46, 47
- glycolysis 43, 151
- Gossypium*
  - arboreum* 140, 137
  - barbadense* 76, 107, 126, 129, 137, 139, 140
  - hirsutum* 5, 6, 10, 11, 13, 15, 17, 73, 75, 80, 82, 83, 97, 109, 110, 111, 137, 138, 140
- growth
  - habit 16, 53, 149
  - inhibitor 87, 89
  - stage 37, 40, 50, 51

## H

### heat

- sensitive 4, 5, 6, 16
- shock 25, 34
- shock protein 25, 47, 56, 150
- stress 3, 5, 6, 8, 10, 13, 17, 54, 91, 92, 94, 153
- tolerance 6, 26
- herbicide tolerance 154
- high temperature stress 1, 3, 5, 13, 15, 16, 92
- hormone 50, 54, 85, 87, 88, 89, 97, 114, 150
- humidity 25, 26, 27, 28, 30, 31, 33, 52
- hydraulic
  - conductance 54, 99, 100, 102
  - conductivity 42, 52, 99, 100, 105
  - lift 98

## I

- indeterminate
  - growth habit 16, 53, 149
- insect
  - resistance 154
  - vector 125, 133
- internode elongation 89
- ion toxicity 104
- irrigation 2, 37, 42, 50, 52, 54, 98, 99, 113, 149

## J

- jet lag 93, 94

## L

- Lambert's Cosine Law 74, 76
- lateral root 97, 106
  - production 105

leaf  
  age 42, 53, 118  
  area 2, 37, 38, 41, 42, 78, 92, 94, 101  
  elongation 48, 90, 91, 92, 94, 98  
  expansion 2, 37, 42, 89, 92  
  extension growth 2, 15  
  gas exchange 91  
  water potential 39, 40, 42, 44, 49, 50,  
    51, 153  
light 27, 73, 74, 76, 77, 78, 79, 82, 87, 91,  
  118  
  intensity 40  
  period 77, 93, 94  
lint percent 17  
lipid 39, 46, 54, 114, 115, 151  
locules 16

## M

malate dehydrogenase 151  
mass flow 115  
meiosis 5  
membrane 17, 28, 31, 35, 51, 59, 114,  
  115, 119, 150, 151, 152  
  integrity 4, 15, 38, 91  
  stabilization 48, 114  
metabolism 2, 43, 44, 46, 47, 49, 55, 76, 86,  
  91, 102, 114, 150, 151, 152  
  metabolic process 39, 40, 41, 43, 50, 152  
micro flora 97  
microgametophyte 5  
microspore 5, 8  
mini-lysimeter 92, 93  
mini-rhizotron 99  
molecular chaperones 47, 150  
mote 16  
mulch 77, 78, 82

## N

NADPH oxidase 11  
nematodes 105  
net assimilation rate 42, 78

night temperature 2, 4, 6, 10, 16, 17  
nitrogen 42, 79, 117  
non-structural carbohydrates 117  
nucleic acid 46, 132, 139  
number of fibers  
  seed 1, 5, 6, 8, 13, 16, 17, 20, 23, 33, 77,  
    78, 117, 121, 122, 130, 155, 160  
number of seeds per boll 16  
nutrient  
  absorption 55, 97  
  availability 116  
  stress 97

## O

okra 42, 76, 131, 135, 136  
  okra-leaf 76  
open boll 4  
optimal temperature 5, 6, 8, 10, 15, 102  
osmoregulation 48, 56, 100  
osmotic  
  adjustment 47, 48, 49, 52, 55, 99, 100, 101  
  potential 49, 100, 101, 150  
ovary 46  
ovules 5, 6, 10, 16, 33, 52, 117, 153  
oxidative  
  pentose phosphate pathway 151  
  stress 10, 17, 23, 46, 47, 118, 155

## P

partitioning 4, 53  
passive diffusion 115  
pectin 152  
perennial 1, 16, 50, 101, 149  
petals 28, 29, 31, 117  
pH 26, 50  
phloem 48, 113, 115, 116, 117, 119, 135  
phosphoenolpyruvate carboxylase 151  
photoinhibition 41, 54, 79, 82  
photomorphogenesis 73, 77, 82  
photoperiod 27, 93, 94  
photorespiration 4, 41, 43, 46

photosynthesis 2, 3, 10, 15, 16, 17, 39, 40, 41, 42, 43, 44, 45, 50, 52, 54, 55, 73, 74, 76, 78, 79, 82, 86, 117, 153  
photosynthetically active radiation 73  
photosynthetic photon flux 76, 91  
photosynthetic rate 10, 39, 40, 41, 42, 43, 76, 79, 88, 118  
*Phymatotrichopsis omnivera* 104  
physiological 15, 25, 26, 37, 39, 50, 52, 53, 55, 56, 79, 86, 88, 100, 115, 149, 153, 154, 155  
physiological maturity 88  
phytochrome 73, 74, 77, 82  
Pima cotton 2, 4, 15, 112  
pistil 6, 8, 10, 12, 17, 55, 91  
plant  
  analysis 113  
  height 38, 77, 78  
  pathogens 97, 104  
  productivity 53, 79, 97, 104, 106  
  virus 125, 130, 139  
plasma membrane 114, 115, 150, 151, 152  
pollen  
  fertility 6  
  germination 5, 6, 8, 17, 26, 27, 28, 29, 30, 114  
  rupture 32  
  tube 5, 6, 7, 8, 10, 18, 19, 26, 27, 30, 31, 33, 114, 151  
  tube growth 5, 6, 8, 10, 11, 12, 17, 151  
  tube length 26, 27, 30, 31, 34  
  viability 6, 18, 27, 32, 34  
  water uptake 32, 34  
pollination 1, 5, 17, 26, 33, 88, 89  
polyamines 13, 46  
pressure potential 100  
productivity 1, 2, 17, 25, 30, 34, 37, 39, 50, 53, 76, 79, 82, 97, 99, 102, 104, 106, 119, 149, 153, 155  
  crop 1, 37, 39, 77, 82, 149  
proline 47, 49, 100  
protein 8, 13, 25, 46, 47, 48, 49, 56, 114, 115, 132, 133, 134, 135, 138, 139, 150, 151, 152, 155  
putrescine 13, 18

## Q

quantitative trait  
  loci 56, 154  
quantum efficiency 3, 10, 15, 41

## R

radial root resistance 100  
radiation 47, 52, 73, 74, 78, 82  
reactive oxygen species 10, 41, 46, 79  
red light 73, 82  
relative growth rate 78  
remobilization 115, 116, 119  
reproductive  
  development 1, 4, 5, 8, 17, 50, 76  
  phase 114  
  stage 42, 44  
  structure 25, 113, 116, 117, 118, 119  
respiration 4, 8, 16, 19, 21, 22, 114, 153  
ripening hormone 87  
RNA 114, 118, 119, 132, 133, 139, 140, 142, 147, 149  
root 3, 37, 38, 48, 49, 52, 55, 77, 87, 97, 98, 99, 100, 102, 104, 105, 106, 107, 114, 115, 116, 118, 150  
  activity 98, 104  
  branching 102, 106  
  development 97, 98, 99, 105, 106  
  function 98  
  growth 3, 83, 98, 101, 102, 104, 106  
  length 97, 99, 102  
  length density 99  
  mass 77  
  morphology 104  
  penetration 97  
  primary 97  
  resistance 100  
  rooting density 98, 99, 105  
  rooting patterns 98, 99  
  root/shoot ratio 73, 77, 82, 98, 138  
  root-zone volume 87  
  secondary 97  
  stress 97  
  system 97, 98, 99, 101, 102, 103, 105, 106  
  water relations 98

roots 18, 21, 97, 98, 99, 100, 102, 103,  
104, 105, 106, 115, 116, 118, 119  
ROS 10, 79  
Rubisco 3, 41  
  rubisco activase 3  
ruderal 15  
  genetic material 15

## S

salinity 54, 104, 149, 153, 155  
salt stress 100  
satellite 139  
  alphasatellites 125, 132, 133, 134, 140  
  betasatellite 125, 133, 134, 135, 139,  
  140  
secondary cell wall 149, 150, 151, 152  
  synthesis 151, 152, 153  
seed  
  development 16, 46, 155  
  induction 13  
  reserve 102  
  set 1, 6, 8, 16, 17, 50, 117  
  weight 16  
seedling growth 1, 104, 155  
semi-arid environment 149  
senescence 42, 48, 79, 87, 88  
sexual reproduction 5, 117  
shade 10, 54, 73, 76, 77, 82  
shallow root 98, 99  
shedding 50, 76, 82, 114, 116, 117, 119  
shoot 2, 3, 38, 55, 77, 98, 99, 101, 102,  
  105, 109, 114, 116, 118, 119  
  dry weight 15, 38, 77, 99, 106  
skip-row 105  
soil  
  borne pathogen 104  
  environment 97  
  moisture 99, 112  
  temperature 99, 102  
source-sink relationship 44, 102  
source strength 10  
spermidine 13

spermine 13  
squaring 76  
staple 151, 153  
starch 8, 38, 42, 44, 117  
stem elongation 37, 77  
stigma 5, 6, 33  
stomata 39, 40, 41, 42, 48, 52, 53, 54, 55,  
  117, 153, 155  
stomatal 91, 92, 94, 95, 100, 108, 153, 155  
  aperture 39, 54, 92, 94  
  closure 39, 40, 41, 91, 153, 155  
  conductance 39, 40, 42, 48, 53, 55, 100  
  resistance 40, 91  
stress  
  acclimation 150  
  tolerance 27, 24, 149, 153, 154, 155, 156  
style 5, 6, 8, 10  
subtending leaf 10, 12, 15, 17  
sucrose 8, 31, 32, 44, 46, 55, 117, 150, 152  
  phosphate phosphatase 152  
  phosphate synthase 152  
  synthase 152  
  synthesis 117  
sugar-alcohol 115, 116  
sugar transport 114  
superoxide dismutase 12, 46, 47, 79

## T

taproot 97, 102, 104, 105, 106  
temperature 1, 2, 3, 4, 5, 6, 7, 8, 10, 11,  
  12, 13, 14, 15, 26, 27, 28, 34, 55,  
  79, 83, 86, 88, 92, 99, 102, 103,  
  105, 108, 109, 110, 111, 112, 149,  
  153, 155, 158  
  canopy 13, 17, 22, 55, 76, 77, 83, 86  
tetraploid cotton 137, 140  
thermal kinetic window 1  
thermosensitive 5, 10, 12, 15, 17  
thermotolerance 8, 10, 12, 14, 15, 17, 20,  
  23, 25  
*Thielaviopsis basicola* 105  
threshold temperature 10

tonoplast 150  
toxicity 89, 104, 113, 114, 115, 118, 119  
transgenic  
  plants 56, 135, 154, 155  
  resistance 139  
translocation 4, 44, 45, 55, 56, 115, 116,  
  117, 119  
transpiration 37, 47, 52, 54, 55, 85, 86,  
  92, 93, 94, 114, 116, 117, 118, 155  
  stream 116, 117, 118  
transporter 119, 122, 123  
turgor 37, 38, 40, 42, 48, 52, 55, 100, 101,  
  150, 151  
  maintenance 55, 100, 101

## U

ultraviolet  
  B 78, 79  
  light 78  
Upland cotton 2, 4, 15, 16, 76  
UV-B 78, 79

## V

VAM 105  
vapor pressure osmometer 99  
vascular 97, 104, 105, 106, 110, 116, 117,  
  118  
vascular bundles 97, 106, 117  
vegetative  
  growth 1, 116, 117, 118  
vertical flowering interval 4  
*Verticillium wilt* 97  
vesicular arbuscular mycorrhizae 105  
virus 125, 128, 129, 130, 131, 132, 133,  
  134, 135, 137, 138, 139, 140

## W

water  
  flux 40, 106  
  holding capacity 98  
  loss 29, 31, 34, 40, 48, 55, 155  
  use efficiency 52, 53, 91

water deficit stress 2, 38, 40, 41, 42, 44,  
  45, 46, 47, 50, 51, 52, 54, 55, 56,  
  87, 89, 95, 149, 150, 153  
water soluble calcium 12  
water stress 2, 28, 37, 39, 41, 46, 47, 50,  
  51, 52, 54, 56, 87, 98, 99, 100, 101,  
  104, 105  
well-watered 33, 47, 55, 91, 94, 100, 101,  
  150  
white flower 5  
white fly 125  
wild  
  species 137  
  type 15, 79, 101  
wild types of cotton 101, 111

## X

xylem 48, 83, 99, 101, 105, 106, 116, 118,  
  151  
xylem vessels 106

## Y

yield 1, 2, 3, 4, 5, 10, 14, 15, 16, 17, 25,  
  48, 50, 51, 52, 53, 54, 55, 76, 77,  
  82, 88, 90, 101, 103, 105, 106, 113,  
  114, 117, 118, 119, 125, 127, 128,  
  129, 131, 139, 149, 153, 154, 156  
  potential 55  
yield variability 16