

Subject Index

- abiotic stress 122, 152
- abscisic acid 57
- acid soil tolerance 219
- activated charcoal 370, 384
- addition lines 197
- adenine 498
- Aegilops speltoides* 203
- A. tauschii* 154
- A. ovata* 74
- agar 221
- agarose 232, 263, 291, 416, 440
- agglutinin 69
- Agrobacterium rhizogenes* 636
- A. tumefaciens* 24
- Agropyron* 6
- albinism 311, 395, 412
- albino plants 9, 71, 429
- albumin 3
- alcohol dehydrogenase 41, 142
- alien substitution 198
 - transfer 122
- aleurone layer 628
- allelic variation 41
- alloplasmic salmon 461
 - addition lines 137
- amphiploids 205
- amino acids 624, 635
- amplification 513
- amylase 146, 635
- amyloplast 395
- androgenesis 7, 287, 343, 372, 382
- androgenetic pathways 389
 - plants 331
- androgenic ability 9
 - anthers 674
 - induction 345
- aneuploids 8, 11, 115, 123, 135, 245, 258, 396
- anther culture 8, 245, 284, 403
 - donor plants 286
- antibiotic drugs 259
 - sensitivity 492
- antifreeze agents 670
- apomixis 207
- artificial seed 44
- ascorbic acid 419
- autoallohexaploids 116
- autopolyploids 116
- autotetraploids 182
- autotriploids 179
- BA 29, 291
- bacteriophage 632
- BAP 31, 301, 498
- barley chromosomes 128
- basal salts 30
- biochemical markers 138
- bran 619
- brown rust 334, 339
- bud pollination 113
- bulbosum technique 7, 10, 340, 448
- bulgar 616
- 4B chromosomes 40
- B5 medium 53, 387
- casein hydrolysate 33, 221, 384, 419, 625
- C-banding 170, 231, 518
- cDNA 632
- cell membrane 647
- cephaloridin 32
- cephalotin 32
- chemical hybridization agents 10
- chemical mutagens 121
- CHA 10
- chimeras 412
- chimeric genes 659
- chloramphenicol 660
- chloroplast DNA 313, 430
 - genome 412
- Chinese cultivars 409
- chromosome doubling 398, 432, 457
 - elimination 670
 - engineering 538
 - rearrangement 7
 - substitution 198
 - translocation 199
 - variation 9, 321
- chromosome 4B 99
- chromosome 5B 449
- clomal variation 509
- coconut milk 31, 37, 72, 99, 221, 263, 417, 491

- colchicine treatment 121, 129, 158
 cold hardiness 205, 564
 – tolerance 3
 – treatment 388, 403, 436
 coleorhiza 58
 copper efficiency genes 219
 cryoability 673
 cryopreservation 17, 49, 669–681
 cryoprotectants 671
 cryostorage 669
 culture conditions 295
 – immature inflorescence 58
 – medium 271, 286, 438
 – ovule 109
 – panicle 109
 – temperature 292
 cultivar Armadillo 230
 – Chinese Spring 449
 – Florin 10, 338
 – Jinghua 1 10, 337
 – Norin 404
 – Orofen 409
 – Rosner 538
 curl mite resistance 167
 cytokinins 29, 81, 291
 cytological analysis 396
 cytophotometric analysis 287
 cytoplasmic DNA 313
 – genes 99, 580
 – mutants 569
- 2,4-D 14, 29, 101, 224, 255, 298, 456, 491
 dark treatment 432
 deletion chromosomes 544
 deletions 425, 534
 dextran 421
 diallel analysis 310
 dicamba 29, 56, 291
 dicentric chromosomes 544
 dietary fiber 617
 differentiation 73, 80, 635
 DH lines 397
 dihaploids 433
 diisosomes 238
 diploid hybrids 174
 diploidization 444
 direct gene transfer 436
 disease resistance 5, 128, 159
 disomic alien additions 117
 distant hybridization 72
 ditelosomic 38
 D genome 159
 DMSO 159, 398, 670
 DNA chloroplast 313, 430
 – cytoplasmic 313
 – libraries 632
 – mitochondrial 313
- recombinant 5, 18, 632
 – ribosomal 343
 donor plants 386, 408
 drought resistance 564
 – tolerance 205
- ear culture 269–282
 electrophoregram 529
 electrophoresis 526
 electrophysiology 651
 electron microscopy 68
 electroporation 15, 619
 Elymus 169
 embryo culture 109, 156, 223, 250–261, 456
 embryogenesis 24, 58, 147, 264, 291, 296,
 311, 387, 393, 420
 embryogenic anthers 9
 – callus 25, 46
 embryoids 8, 385
 endomitosis 322
 endosperm extract 221
 endoreduplication 322
 epigenetic 325, 432, 502
 epistatic genes 144
 epistasis 311
 ergot 219
Erysiphe graminis 159, 354, 541
 establishment of callus 24
 ethrel 10, 31
 euhaploids 451
 euplasmic 461
 euplasmic lines 583
 euploids 491
 explants 35
 extranuclear organelles 569
 eye spot resistance 123, 339
- fenridazone-potassium 10
 fiber 618
 Ficoll 416, 420
 float culture 292
 Florin cultivar 10, 338
 frozen callus 676
 – cell suspension 676
 – embryos 673
 – pollen embryos 674
 – seeds 672
 fungicides 570
- GA 5, 31, 56, 129, 417
 galactose 55
 gametoclonal variation 11, 319, 479, 538
 gametocides 10, 288, 369
 gelling agents 291
 gene transfer 197
 genetic analysis 38, 47, 374, 538
 – changes 11

- engineering 4, 632
- erosions 669
- manipulation 5, 116, 436
- markers 245
- resources 568
- transformation 5, 379
- genome B 152
- genome elimination 114
- genomic analysis 169
 - stability 82
- genotype effect 71
 - variation 71, 407, 437
- generative cell 430
- germplasm 669
- gliadin 3, 12, 16, 502, 526, 625, 628, 633
- globulins 3, 628
- glucose 34, 55
- glum blotch 334
- glutamine 273, 289, 387, 407, 417, 441
- gluten 615, 628
- glutelin 3, 505
- glutenins 629
- glycine 262
- grain quality 226
- growth regulators 29, 224, 426

- haploid cells 413
 - production 283–447
- haploids 7, 9, 453
- herbicides 12, 259, 571
- heteroploids 316
- heterosis 196, 305
- hexaploid hybrids 185
 - triticale 226
- high protein wheat 593–613
- histidine 273
- homozygous lines 448
 - plants 7
- hordeins 148
- Hordeum bogdanii* 112
- H. bulbosum* 10, 136
- H. chilensis* 112
- H. vulgare* 112
- hormone metabolism 28
- hybridization 159, 240
- hybrids 115, 258
- hypoploids 141

- IAA 14, 56, 221, 491, 498
- imbibition 90
- inbred lines 293
- inbreeding generation 342
- induced translocation 119
- induction medium 387
- interspecific hybridization 122
- intrageneric hybridization 180, 449
- in vitro mutants 568
 - propagation 397
 - technology 1
- irradiation 448
- isochromosomes 317
- isozyme genes 144
 - markers 199
- isozymes 231, 635

- Jingua 1 10, 337

- karyotype analysis 170
- kernel protein 634
- kinetin 56, 394

- leaf rust 153, 365
- light effect 277
- lignin 618
- liquid media 416
 - nitrogen 405, 671
- lodging resistance 3, 557
- luciferase 661
- lysine 219, 617, 636

- macroni 3, 616
- major minerals 272
- malate dehydrogenase 142
- male gametogenesis 412
 - sterility 132, 475
- media 29, 53, 81, 156, 271, 426
- meiotic analysis 174
- methionine 16
- microinjection 436
- micropropagation 1
- minerals 618
- mitochondrial DNA 313
- mitotic activity 46
- mixoploids 315, 513, 541
- monoclonal antibodies 69
- molecular genetics 245, 547
 - markers 148, 344
- monotelosomic additions 138
- morphogenesis 28, 492, 633
- morphogenetic potential 679
- multinucleate pollen 409
- multiple allelism 526
 - genes 407
 - shoots 225
- multivalent chromosomes 5
- mutagenic chemicals 448
- mutagenesis 436
- mutations 47, 479, 534, 549–589, 633, 671
- mRNA 632

- NAA 56, 101
- N6 medium 7, 53, 388, 438
- nematode resistance 120, 128
- nematodes 12

- nicotinic acid 426, 617
 nitrogenase reductase 602
 nuclear fusion 322
 nulli-haploids 136
 nullisomics 38, 170, 202
 nulli-tetrasomics 527
 nutritional improvement 15, 591, 613–643
 – value 3

 organelle gene mutation 12
 organogenesis 24, 47, 58, 296, 311, 429, 512
 organoleptic qualities 3
 ovule culture 109, 262–268

 panicle culture 109, 269
Panicum maxicum 58
 parthenogenesis 463
Pascopyrum 169
 pasta products 494
 pathotoxins 259
 patch-clamp technique 648
 pentaploid hybrids 183
 pericentric inversions 138
 pesticides 369
 phospholipids 617
 phytohormones 55
 physiological analysis 74
 picloram 29, 56, 291, 429
 plasmalemma 653
 plastid DNA 412, 660
 ploidy variation 444
 point mutation 345, 425
 pollen callus 411, 425
 – culture 435
 – dimorphism 303, 367
 – embryos 405, 411, 413, 440, 674
 – plants 314, 396, 411
 – polymorphism 365
 polyembryony 224
 polyethylene glycol 84, 636, 659
 polyhaploids 114, 121, 448
 polyploids 17, 141, 549
 potato medium 7, 289, 367, 387
 powdery mildew 120, 153, 365, 508
 pretreatments 288
 prolamine 521
 proline 383, 670
 protein 123, 231, 624
 – efficiency ratio 625
 protoplasts 5, 14, 46, 60, 645, 659
Puccinia graminis 159
P. striiformis 496
P. tritricina 359
 pure isogenic lines 245
 pyridoxine 419

 recombinant DNA 5, 18, 632

 regeneration 24, 46, 254, 337, 370, 387, 411,
 438, 513, 633
 RFLP 123, 234, 245, 343, 370
 release of varieties 283
 reported gene 662
 restriction site mapping 146
Rhizocoenosis 560
 ribosomal DNA 343
 rust resistance 198
 rye chromosomes 238

 Salmon method 460–478
 salt tolerance 196, 205
 scanning electron microscopy 392
 scutellum 94, 256
Secale cereal 5, 170
 seed protein 145
 selfish gene 629
 semolina 507
Septoria tritici 219, 496
 serine 290
 shikimate dehydrogenase 143
 single gene mutation 12
 shoot regeneration 26
 soil salinity 128
 somaclonal variation 4, 11, 24, 73, 101, 121,
 204, 258, 341, 433, 445, 452, 511, 669
 somatic embryogenesis 1, 47–97, 296, 673
 – hybridization 5, 18, 250, 677
 spontaneous diploids 9
 – doubling 444
 – mutation 550
 – translocation 119
 streak mosaic virus 204
 sugars 34, 271

 telosomics 544
 temperature effect 277
 teratoma 47
 tetraploids 450
 tetrasomics 202
 thiamine 15, 72, 617, 622
Thinopyrum bessarabicum 168
Th. distichum 168
Th. elongatum 184
Th. intermedium 184
Th. junceum 168
 tiller pretreatment 404
 totipotency 46
 transient gene expression 14, 645, 659–669
 translocation 17, 119, 471, 544
 triploid hybrids 179
 trivalents 191
 transformation 24, 636, 659
 Triticale 6, 218–228, 235, 382, 511, 627
 Triticale x wheat hybrids 229–249
Triticosecale 6, 115, 511

- Triticeae 111, 167
Triticum aegilopoides 4
T. aestivum 4
T. dicoccoides 8
T. dicoccum 4
T. macha 4
T. monococcum 129
T. pursicum 4
T. spelta 4
T. species 253
Triticum aestivum x *Secale cereal* 111
Triticum durum x *Secale cereal* 218–228
Triticum x *Aegilops* 152
Triticum x *Agropyron* 118
tryptophan 16, 80, 625
tyrosine 625

valine 625
var An Cul 28 353

vernalization 158, 561
vitamins 622

wheat breeding 3
– grass 205
– varieties 552–556
wheat x *Thinopyrum* hybrids 167–217
wide crosses 128
– hybridization 5, 109

X-irradiation 199, 618

yeast 615
yellow rust 197
– dwarf virus 204
y-rays 288

zeatin 29, 56, 498