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| **Table S1 Annotated genes in 5H centromeric region spanning 22 Mb** |
| **Gene** | **Annotation** |
| HORVU5Hr1G060140.8 | Endoglucanase 11 |
| HORVU5Hr1G060210.2 | sugar transporter 2 |
| HORVU5Hr1G060220.35 | sugar transporter 2 |
| HORVU5Hr1G060250.1 | annexin 5 |
| HORVU5Hr1G060280.1 | unknown function |
| HORVU5Hr1G060300.1 | rRNA 2'-O-methyltransferase fibrillarin |
| HORVU5Hr1G060310.22 | Two-component response regulator ORR24 |
| HORVU5Hr1G060340.1 | xyloglucan endotransglucosylase/hydrolase 28 |
| HORVU5Hr1G060370.2 | vacuolar iron transporter 1 |
| HORVU5Hr1G060410.1 | Plastid transcriptionally active 5, putative isoform 1 |
| HORVU5Hr1G060450.5 | TRICHOME BIREFRINGENCE-LIKE 14 |
| HORVU5Hr1G060460.6 | trehalose phosphate synthase |
| HORVU5Hr1G060480.1 | WD-40 repeat family protein |
| HORVU5Hr1G060490.1 | pectinesterase family protein |
| HORVU5Hr1G060510.1 | S12-like, 30S ribosomal protein S12 subfamily protein |
| HORVU5Hr1G060530.1 | Photosystem II CP43 reaction center protein |
| HORVU5Hr1G060540.1 | F-box domain containing protein |
| HORVU5Hr1G060570.46 | Integrator complex subunit 11 homolog |
| HORVU5Hr1G060580.1 | protein kinase family protein |
| HORVU5Hr1G060590.1 | Integrator complex subunit 11 homolog |
| HORVU5Hr1G060620.1 | Centromere protein V |
| HORVU5Hr1G060640.1 | protein-serine kinase 1 |
| HORVU5Hr1G060650.1 | myb domain protein 20 |
| HORVU5Hr1G060660.3 | UDP-D-glucuronate 4-epimerase 1 |
| HORVU5Hr1G060670.1 | Fe-S cluster assembly factor HCF101, chloroplastic |
| HORVU5Hr1G060690.4 | ABC transporter G family member 19 |
| HORVU5Hr1G060700.1 | thioredoxin 2 |
| HORVU5Hr1G060710.1 | HV711N16.8 |
| HORVU5Hr1G060730.1 | jasmonate-zim-domain protein 3 |
| HORVU5Hr1G060790.6 | plant UBX domain-containing protein 2 |
| HORVU5Hr1G060800.2 | HMG-Y-related protein A |
| HORVU5Hr1G060810.2 | phosphatidylinositol-4-phosphate 5-kinase family protein |
| HORVU5Hr1G060860.1 | unknown function |
| HORVU5Hr1G060870.5 | Cytochrome P450 superfamily protein |
| HORVU5Hr1G060880.1 | Auxin-induced protein 5NG4 |
| HORVU5Hr1G060890.1 | DnaJ protein P58IPK homolog |
| HORVU5Hr1G060900.1 | undescribed protein |
| HORVU5Hr1G060910.1 | F-box domain containing protein-like |
| HORVU5Hr1G060920.5 | ubiquitin 5 |
| HORVU5Hr1G060930.2 | Disease resistance protein |
| HORVU5Hr1G060970.1 | Disease resistance protein RPM1 |
| HORVU5Hr1G060980.5 | Transmembrane protein, putative |
| HORVU5Hr1G061010.8 | 11S seed storage protein |
| HORVU5Hr1G061020.11 | DNA mismatch repair protein MutS |
| HORVU5Hr1G061030.1 | undescribed protein |
| HORVU5Hr1G061040.3 | NF-180 |
| HORVU5Hr1G061100.1 | DNA mismatch repair protein MSH6 |
| HORVU5Hr1G061110.1 | LRR receptor-like serine/threonine-protein kinase EFR |
| HORVU5Hr1G061120.1 | agenet domain-containing protein / bromo-adjacent homology (BAH) domain-containing protein |
| HORVU5Hr1G061130.1 | Heavy metal transport/detoxification superfamily protein |
| HORVU5Hr1G061140.1 | Dihydrolipoyllysine-residue acetyltransferase component of pyruvate dehydrogenase complex |
| HORVU5Hr1G061150.2 | receptor kinase 1 |
| HORVU5Hr1G061160.3 | heat shock protein 21 |
| HORVU5Hr1G061170.1 | Hsp20/alpha crystallin family protein, expressed |
| HORVU5Hr1G061180.1 | Transcription initiation factor TFIID subunit 2 |
| HORVU5Hr1G061190.1 | Transcription initiation factor TFIID subunit 2 |
| HORVU5Hr1G061210.1 | unknown function |
| HORVU5Hr1G061220.2 | unknown function |
| HORVU5Hr1G061230.1 | unknown function |
| HORVU5Hr1G061200.18 | Transcription initiation factor TFIID subunit 2 |
| HORVU5Hr1G061250.11 | Baculoviral IAP repeat-containing protein 7-B |
| HORVU5Hr1G061270.1 | Retarded palea 1 protein |
| HORVU5Hr1G061300.2 | BREVIS RADIX-like 3 |
| HORVU5Hr1G061340.1 | Cytochrome P450 superfamily protein |
| HORVU5Hr1G061360.1 | phospholipid:diacylglycerol acyltransferase |
| HORVU5Hr1G061370.2 | Far-red impaired response protein-like |
| HORVU5Hr1G061380.1 | unknown function |
| HORVU5Hr1G061390.1 | Chromosome 3B, genomic scaffold, cultivar Chinese Spring |
| HORVU5Hr1G061410.29 | Homeobox-leucine zipper protein HOX10 |
| HORVU5Hr1G061440.3 | undescribed protein |
| HORVU5Hr1G061460.1 | Protein kinase superfamily protein |
| HORVU5Hr1G061480.2 | FBD-associated F-box protein |
| HORVU5Hr1G061500.1 | GPI-GlcNAc transferase complex, PIG-H component |
| HORVU5Hr1G061510.1 | Mediator of RNA polymerase II transcription subunit 20b |
| HORVU5Hr1G061520.3 | Adenine nucleotide alpha hydrolases-like superfamily protein |
| HORVU5Hr1G061530.3 | Aspartyl aminopeptidase |
| HORVU5Hr1G061540.1 | O-fucosyltransferase family protein |
| HORVU5Hr1G061570.1 | Mixed-linked glucan synthase 2 |
| HORVU5Hr1G061580.4 | Secretory carrier-associated membrane protein 4 |
| HORVU5Hr1G061660.11 | gamete expressed protein 1 |
| HORVU5Hr1G061670.1 | LRR receptor-like serine/threonine-protein kinase EFR |
| HORVU5Hr1G061680.1 | undescribed protein |
| HORVU5Hr1G061710.2 | RELA/SPOT homolog 3 |
| HORVU5Hr1G061730.2 | unknown protein; BEST Arabidopsis thaliana protein match is: unknown protein . |
| HORVU5Hr1G061750.3 | CBS domain-containing protein CBSCBSPB5 |
| HORVU5Hr1G061760.2 | Protein kinase superfamily protein |
| HORVU5Hr1G061770.1 | Cathepsin B-like cysteine proteinase |
| HORVU5Hr1G061810.2 | Protein kinase superfamily protein |
| HORVU5Hr1G061820.6 | Protein kinase superfamily protein |
| HORVU5Hr1G061830.1 | DEP1 |
| HORVU5Hr1G061840.7 | DEP1 |
| HORVU5Hr1G061850.11 | Protein kinase superfamily protein |
| HORVU5Hr1G061860.1 | GDSL esterase/lipase |
| HORVU5Hr1G061870.1 | Ribosome production factor 2 homolog |
| HORVU5Hr1G061880.3 | GDSL esterase/lipase |
| HORVU5Hr1G061930.2 | Cytochrome P450 superfamily protein |
| HORVU5Hr1G061950.2 | Cytochrome P450 superfamily protein |
| HORVU5Hr1G061960.1 | Cytoplasmic tRNA 2-thiolation protein 1 |
| HORVU5Hr1G061970.11 | Phenylalanine--tRNA ligase alpha subunit |
| HORVU5Hr1G061990.1 | Subtilisin-like protease |
| HORVU5Hr1G062010.4 | ubiquitin family protein |
| HORVU5Hr1G062000.1 | AIG2-like (avirulence induced gene) family protein |
| HORVU5Hr1G062030.9 | Alcohol dehydrogenase |
| HORVU5Hr1G062040.1 | Protein SCAI |
| HORVU5Hr1G062050.1 | copper transporter 5 |
| HORVU5Hr1G062070.1 | copper transporter 5 |
| HORVU5Hr1G062080.1 | Deoxyuridine 5'-triphosphate nucleotidohydrolase |
| HORVU5Hr1G062090.1 | Aldehyde dehydrogenase family 7 member A1 |
| HORVU5Hr1G062110.4 | DNA topoisomerase 2-binding protein 1 |
| HORVU5Hr1G062120.7 | Leucine-rich receptor-like protein kinase family protein |
| HORVU5Hr1G062140.1 | alpha/beta-Hydrolases superfamily protein |
| HORVU5Hr1G062160.5 | Lung seven transmembrane receptor family protein |
| HORVU5Hr1G062200.3 | exocyst subunit exo70 family protein D1 |
| HORVU5Hr1G062220.2 | Pectin lyase-like superfamily protein |
| HORVU5Hr1G062240.1 | Chlorophyll a-b binding protein 7, chloroplastic |
| HORVU5Hr1G062250.1 | undescribed protein |
| HORVU5Hr1G062260.1 | Cytochrome P450 superfamily protein |
| HORVU5Hr1G062290.6 | Protein TIFY 3B |
| HORVU5Hr1G062300.2 | undescribed protein |
| HORVU5Hr1G062310.1 | 10 kDa chaperonin |
| HORVU5Hr1G062320.2 | DNA cross-link repair 1A protein |
| HORVU5Hr1G062350.1 | Flavin-containing monooxygenase |
| HORVU5Hr1G062360.1 | Breast carcinoma-amplified sequence 3 like |
| HORVU5Hr1G062370.4 | Choline/ethanolamine kinase |
| HORVU5Hr1G062410.6 | Hypersensitive-induced response protein 1 |
| HORVU5Hr1G062450.1 | unknown function |
| HORVU5Hr1G062460.1 | callose synthase 1 |
| HORVU5Hr1G062490.2 | respiratory burst oxidase homolog A |
| HORVU5Hr1G062510.4 | Dormancy/auxin associated family protein |
| HORVU5Hr1G062530.3 | 2Fe-2S ferredoxin |
| HORVU5Hr1G062570.1 | undescribed protein |
| HORVU5Hr1G062580.1 | SAUR-like auxin-responsive protein family |
| HORVU5Hr1G062610.10 | Disease resistance protein |
| HORVU5Hr1G062620.2 | Jasmonate-induced protein, putative |
| HORVU5Hr1G062630.1 | unknown function |
| HORVU5Hr1G062640.1 | Jasmonate-induced protein, putative |
| HORVU5Hr1G062660.1 | NOL1/NOP2/sun family protein |
| HORVU5Hr1G062670.1 | Disease resistance protein RGA2 |
| HORVU5Hr1G062680.5 | disease resistance family protein / LRR family protein |
| HORVU5Hr1G062690.1 | Heavy metal transport/detoxification superfamily protein |
| HORVU5Hr1G062730.1 | undescribed protein |
| HORVU5Hr1G062720.2 | SAUR-like auxin-responsive protein family |
| HORVU5Hr1G062740.3 | Coffea canephora DH200=94 genomic scaffold, scaffold\_103 |
| HORVU5Hr1G062780.7 | Abhydrolase domain-containing protein 1 |
| HORVU5Hr1G062820.24 | Serine protease HTRA3 |
| HORVU5Hr1G062830.4 | Serine protease HTRA3 |
| HORVU5Hr1G062840.5 | unknown function |
| HORVU5Hr1G062850.1 | Late embryogenesis abundant (LEA) hydroxyproline-rich glycoprotein family |
| HORVU5Hr1G062860.4 | RING/U-box superfamily protein |
| HORVU5Hr1G062880.4 | Kelch repeat-containing protein |
| HORVU5Hr1G062890.4 | Glycine--tRNA ligase beta subunit |
| HORVU5Hr1G062900.1 | HIPL1 protein |
| HORVU5Hr1G062940.1 | Ethylene-responsive transcription factor 1 |
| HORVU5Hr1G062970.2 | ABI3-interacting protein 2-1 protein |
| HORVU5Hr1G062980.1 | DNA-directed RNA polymerase subunit beta |
| HORVU5Hr1G062990.1 | alanine aminotransferase 2 |
| HORVU5Hr1G063000.9 | ARID/BRIGHT DNA-binding domain-containing protein |
| HORVU5Hr1G063010.1 | FAR1 family, putative |
| HORVU5Hr1G063050.1 | receptor-like kinase 1 |
| HORVU5Hr1G063070.3 | FAR1 family, putative |
| HORVU5Hr1G063130.1 | P0047B08.6 protein |
| HORVU5Hr1G063170.2 | undescribed protein |
| HORVU5Hr1G063200.1 | Protein of unknown function (DUF1230) |
| HORVU5Hr1G063220.1 | undescribed protein |
| HORVU5Hr1G063230.1 | Aspartic proteinase nepenthesin-1 |
| HORVU5Hr1G063240.1 | Galactosyltransferase family protein |
| HORVU5Hr1G063260.2 | pectinesterase family protein |
| HORVU5Hr1G063270.3 | GRAS family transcription factor |
| HORVU5Hr1G063320.4 | Protein of unknown function (DUF581) |
| HORVU5Hr1G063330.2 | Galactosyltransferase family protein |
| HORVU5Hr1G063340.3 | ATP-dependent zinc metalloprotease FtsH 2 |
| HORVU5Hr1G063360.2 | zinc finger protein 2 |
| HORVU5Hr1G063370.1 | unknown function |
| HORVU5Hr1G063380.19 | Pentatricopeptide repeat-containing protein |
| HORVU5Hr1G063390.1 | zinc finger protein 2 |
| HORVU5Hr1G063400.2 | Transcription initiation factor TFIID subunit 10 |
| HORVU5Hr1G063410.1 | myb domain protein 36 |
| HORVU5Hr1G063420.2 | glutamate receptor 2.8 |
| HORVU5Hr1G063430.8 | glutamate receptor 2.8 |
| HORVU5Hr1G063440.16 | glutamate receptor 2.7 |
| HORVU5Hr1G063450.1 | LRR receptor-like serine/threonine-protein kinase EFR |
| HORVU5Hr1G063470.1 | alpha/beta-Hydrolases superfamily protein |
| HORVU5Hr1G063480.1 | glutamate receptor 2.8 |
| HORVU5Hr1G063490.1 | glutamate receptor 2.7 |
| HORVU5Hr1G063500.1 | glutamate receptor 2.8 |