

# SUMMARY: Plant-TEC List July 2017



New or updated technologies are listed in RED. Technologies currently in the TEC exclusivity period are listed in BLUE.

TECH ID	TECHNOLOGY	PATENT REFERENCE	FIELD OF USE & LITERATURE REFERENCE	RELEASE DATE	SOURCE ORGANISATION	LEAD SCIENTIST
<b>CROP PERFORMANCE TECHNOLOGY</b>						
<b>DEVELOPMENT AND YIELD</b>						
07.436	Da1	WO/2009/047525 US2011-0004962	Gene controlling plant seed and organ size, and plant biomass. Genes and Development (2008); 22 (10): 1331-6.	07-Jan-08	John Innes Centre	Yunhai Li
09.488	Control of Pod Shattering	WO/2011/157976	Manipulation of gibberellin levels for finely controlling fruit patterning in plants. Genes Dev (2010); 24: 2127-2132.	29-Jun-10	John Innes Centre	Lars Ostergaard
09.496	Temperature Sensing	WO/2011/083290 US 2013/0239252 A1	Modify temperature effects by controlling the presence of H2A.Z in the nucleosome. Cell (2010); 140 (1): 136-147.	15-Jan-10	John Innes Centre	Phil Wigge
12.529	Eod3 Gene	WO/2013/108017	Increased seed size, plant growth and grain yield. Plant Journal (2012); Vol 70: 929-939.	10-Oct-12	IGDB, Chinese Academy of Sciences	Yunhai Li
12.546	OsNRT2.3b	WO/2014/122452	NRT2.3b: Enhanced Yield and Nitrogen Use.	26-Mar-13	John Innes Centre and Nanjing Agricultural University	Tony Miller
12.548	DDA1 Gene	WO/2014/191539	DDA1 gene for mitigating negative ABA effects on growth during abiotic stress. Plant Cell (2014); 26(2): 712-28.	12-Jun-13	CSIC / Centro Nacional de Biotecnología in Madrid	Vicente Rubio
12.550	HaHB11 Gene	WO/2013/116750 A1	HaHB11 Gene for Increased Yield and Abiotic Stress Tolerance. Journal of Biotechnology; 222: 73-83.	02-Oct-13	Universidad Nacional del Litoral	Raquel Chan
13.561	DA2 Gene	WO2015/022192	Increased seed size, plant growth and grain yield when downregulated together with da1 mutants. The Plant Cell September 2013; 25 (9): 3347-3359.	18-Sep-13	John Innes Centre and IGDB, Chinese Academy of Sciences	Mike Bevan
13.568	SP1 Gene and Plastid Transition	WO/2014/037735 A1	SP1: Improved plant performance by manipulation of plastid transition. Current Biology (2015).	18-Sep-13	University of Leicester	Paul Jarvis
14.584	HaWRKY76	WO/2015/166256	HaWRKY796 for increased yield and stress tolerance. Novel gene with WKKY domain. Plant Cell Reports (2015), DOI 10.1007/s00299-015-1852-3.	09-Feb-15	Universidad Nacional del Litoral	Raquel Chan
14.585	Temperature Resilience	Patent applications pending	Temperature Resilient Disease Resistance and Yield. Modifying PIF4-mediated thermosensory signaling. Current Biology January 23, 2017; 27: 1-7, <a href="http://dx.doi.org/10.1016/j.cub.2016.11.012">http://dx.doi.org/10.1016/j.cub.2016.11.012</a> .	11-Jan-17	John Innes Centre	Vinod Kumar
14.586	SOD7/NGAL3	Patent applications pending	KO of SOD7 and NGAL3 (together) increases seed size. Plant Physiol; 169(3): 2118-28.	09-Feb-15	IGDB, Chinese Academy of Sciences	Yunhai Li
15.600	pNAR:NRT	Patent applications pending	pNAR:NRT Enhanced Yield and Nitrogen Use. Plant Bio Journal (2016); DOI: 10.1111/pbi.12531.	18-Jan-16	Nanjing Agricultural University	Xiaorong Fan
16.611	DWARF2/D2 - smg11	Patent applications pending	Increased seed size and grain yield. Rice (2016); 9:64 DOI: 10.1186/s12284-016-0136-z.	06-Dec-16	IGDB, Chinese Academy of Sciences	Yunhai Li
16.613	UPL3	Patent applications pending	Down regulation of UPL3 increases seed yield and total content of protein and lipid in seeds.	11-Jan-17	John Innes Centre	Mike Bevan
16.615	G3PT3	Patent applications pending	Overexpressing GmPT3 increases root hairs and seed number, overall increasing yield. Manuscript in preparation.	17-May-17	Fujian Agriculture and Forestry University	Hong Liao
16.617	GmPT7	Patent applications pending	Increasing yield and nutrient use in soybean and other legumes. Manuscript submitted and under review.	13-Mar-17	Fujian Agriculture and Forestry University	Hong Liao
17.621	GSE5	Patent applications pending	Increased seed size and grain yield (achieved by genome editing). Mol Plant (2017); 10(5): 685-694 DOI: <a href="http://dx.doi.org/10.1016/j.molp.2017.03.009">http://dx.doi.org/10.1016/j.molp.2017.03.009</a>	17-May-17	IGDB, Chinese Academy of Sciences	Yunhai Li
17.625	NPT1 / OTUB1	Patent applications pending	Novel High Yielding Rice Ideotype. The Plant Journal (2017); DOI: 10.1111/tbj.13613.	11-Jul-17	IGDB, Chinese Academy of Sciences	Xiangdong Fu Yunhai Li
<b>STRESS RESISTANCE AND YIELD</b>						
01.266	Flavodoxin	WO/2003/035881 US 6,781,034	Enhanced reactive oxygen protection for resistance to a wide range of abiotic, biotic and xenobiotic stresses. Plant J (2009); 60 (6); 962-973.	01-Nov-02	Universidad Nacional de Rosario	Nestor Carrillo
12.550	HaHB11 Gene	WO/2013/116750 A1	HaHB11 Gene for Increased Yield and Abiotic Stress Tolerance. Journal of Biotechnology; 222: 73-83.	02-Oct-13	Universidad Nacional del Litoral	Raquel Chan
14.582	ZmDREB2.7	WO/2015/007240 US-2016-0160230-A1 CN 105934150 A	A maize DREB gene capable of conferring drought tolerance in transgenic crops. PLoS Genetics 9(9): e1003790. doi:10.1371/journal.pgen.1003790.	22-Jul-14	Institute of Botany, Chinese Academy of Sciences	Feng Qin
15.598	ZmNAC111	WO/2017/013439	Drought Tolerance in monocot and dicot plants. Nature Comms (2015); 6:8326 DOI:10.1038.	10-Nov-15	Institute of Botany, Chinese Academy of Sciences	Feng Qin
<b>CROP NUTRIENT USE</b>						
12.546	OsNRT2.3b	WO/2014/122452	NRT2.3b: Enhanced Yield and Nitrogen Use.	26-Mar-13	Nanjing Agricultural University and John Innes Centre	Guohua Xu Xiaorong Fan Tony Miller
13.571	PT8 Mutant	WO 2015/058479 A1	Increased crop yield in low and normal phosphate soil conditions. Chen et al. Relieving CK2-mediated phosphorylation of a phosphate transporter improved rice yield under low Pi soils. Plant Cell (2015); 27(3): 711-23.	24-Feb-14	Zhejiang University	Ping Wu Jieyu Chen
15.600	pNAR:NRT	Patent applications pending	pNAR:NRT Enhanced Yield and Nitrogen Use. Plant Bio Journal (2016) submitted. Plant Bio Journal (2016); DOI: 10.1111/pbi.12531.	18-Jan-16	Nanjing Agricultural University	Xiaorong Fan

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TECH ID	TECHNOLOGY	PATENT REFERENCE	FIELD OF USE & LITERATURE REFERENCE	RELEASE DATE	SOURCE ORGANISATION	LEAD SCIENTIST
<b>CROP COMPOSITION AND QUALITY</b>						
10.508	High Oleic Acid Oilseed	WO/2012/117256 US 2014/0150132 A1	Oil Seed Rape FAD2 Mutants with increased mono-unsaturated fatty acid content.	02-Mar-11	John Innes Centre	Ian Bancroft
10.512	Reduced Gliadin Wheat	WO/2010/0089437A1 WO2014/202688	RNAi of wheat gliadins produces wheat with drastically reduced gliadin fraction. PLOS One (2014); 9(3): DOI: 10.1371/journal.pone.0090898.	01-Dec-10	CSIC Institute for Sustainable Agriculture	Franciso Barro
12.533	High Phytase Cereals	WO/2012/146597 EP 2702156 US 9,540,633	Non-GM wheat with seed phytase levels 5-8x the levels commonly seen in wheat. Plant Physiology (2011); 156: 1087-1100.	11-May-12	Aarhus University	Henrik Brinch-Pedersen
<b>PEST / DISEASE RESISTANCE AND CROP PROTECTION TECHNOLOGY</b>						
05.395	Peptide Aptamers	US 8,168,748	Virus resistance strategy making use of peptide aptamers to enable broad-spectrum resistance. J Virol (2006); 80: 5841-5953.	27-Sep-06	North Carolina State University	Linda Hanley-Bowdoin
07.425 07.426	Late Blight Resistance	WO/2009/013468 US 8,367,893	Isolation and cloning of several late blight resistance genes from wild potato species. Genes conferring resistance to the devastating late blight disease, Phytophthora infestans. MPMI (2009); 22: 589-600.	01-Mar-10	Sainsbury Laboratory	Jonathan Jones
14.583	Mlo Wheat	WO/2015/109752 EP3097194	Disease Resistant Wheat. Powdery mildew resistant wheat. A, B and D genome TaMLO homologues inactivated by genome editing. Nature Biotechnology (2014); 32, 947-951.	22-Jul-14	IGDB, Chinese Academy of Sciences	Caixia Gao
14.585	Temperature Resilience	Patent applications pending	Temperature Resilient Disease Resistance and Yield. Modifying PIF4-mediated thermosensory signaling. Current Biology January 23, 2017; 27: 1-7, <a href="http://dx.doi.org/10.1016/j.cub.2016.11.012">http://dx.doi.org/10.1016/j.cub.2016.11.012</a> .	11-Jan-17	John Innes Centre	Vinod Kumar
<b>ENABLING TECHNOLOGY</b>						
<b>PROMOTERS &amp; SELECTABLE MARKERS</b>						
04.345	Rubi3 Promoter / Intron	US 8,022,271	Rice polyubiquitin promoter and intron - high level expression in transgenic rice and corn. Molecular Genetics and Genomics (2008); 279(6):563-72.	01-Jun-04	North Carolina State University	Ron Qu
06.414	Root-Specific Promoters	US 7,982,096	Root-specific promoters from oats suitable for driving gene expression in monocots and dicots. Proc Natl Acad Sci, USA (2006); 103 (49): 18848-18853.	28-Feb-07	John Innes Centre	Anne Osbourn
09.479	PsEND1 Promoter	WO/2001/073088A1	PsEND1 Anther-specific Promoter. Plant Cell Reports (2010); 29(1): 61-77.	03-Sep-09	Universidad Politécnica de Valencia	José-Pío Beltrán
<b>SILENCING</b>						
99.192	TRV VIGS	US 6,369,296	Tobacco rattle virus VIGS vectors for high throughput and rapid gene discovery. Plant Journal (2002); 31(6): 777-786.	18-Jun-03	Sainsbury Laboratory	David Baulcombe
01.258	Gemini virus vectors	US 6,759,571	Geminivirus based gene function analysis with broad crop range targets. Plant Molecular Biology (2007); 65: 163-175.	24-Oct-05	University of North Carolina	Niki Robertson
04.365	TRV VIGS - improvements	US 7,229,829	Modified TRV vector, with demonstrated facilitated cloning of tomato ESTs. Plant Journal (2004); 39: 734-746.	24-Oct-05	Yale University	Dinesh Kumar
<b>EXPRESSION SYSTEMS</b>						
99.194	Suppressors of gene silencing	US 7,217,854 EP 1,232,274	Suppressors of post transcriptional gene silencing from plant viruses. Plant Journal (2003); 33: 949-956.	01-Nov-02	Sainsbury Laboratory	David Baulcombe
05.386	CPMV based protein expression system	WO/2007/135480 US 8,519,113	Virus based system for expression of proteins in plants without production of infective viral particles. Plant Biotechnology (2008); 6 (1): 82-92.	30-May-06	John Innes Centre	George Lomonosoff
07.439	HT CPMV: Extreme high level protein expression	WO/2009/087391 US 8,674,084	Mutagenesis of CPMV expression system results in heterologous protein production of up to 30% of total soluble protein. Small (2010); 6 (7): 818-821.	07-Jan-08	John Innes Centre	George Lomonosoff
<b>GENERAL TECHNOLOGY</b>						
12.552	Novel Method for RNA Production	WO/2015/177100 A1	Large amounts (up to 150mg per litre of culture volume) of a target RNA can be produced in host cells using a modified plant viroid in which the coding sequence of the target RNA is inserted. (MS submitted).	03-Jun-14	UP Valencia / IBMCP	José-Antonio Daròs
14.580	"OSC" Hybrid Rice	WO/2013/082865 EP2789690	Reversible nuclear male sterility system and germplasm for hybrid rice production. Potential for analogous use in other crops. (MS submitted).	03-Jun-14	Institute of Botany, Chinese Academy of Sciences	Xiaoquan Qi
16.603	YAO promoter for CRISPR	WO/2017/054721	Use of the YAO promoter in the CRISPR/Cas9 system for high efficient site-directed editing of plant genomes. Molecular Plant (2015); 8(12): 1820-1823.	20-Jun-16	IGDB, Chinese Academy of Sciences	Qi Xie