

REFERENCES

- Altschul, S.F., T.L. Madden, A.A. Schaffer, J. Zhang, Z. Zhang, W. Miller and D.J. Lipman. 1997. Gapped BLAST and PSI-BLAST: A new generation of protein database search programs. *Nucleic Acids Research* 25:3389-3402.
- Arias, R.S., S.A. Filichkin and A.H. Strauss. 2006. Divide and conquer: development and cell cycle genes in plant transformation. *Trends in Biotechnology* 24:267-273.
- Arinaitwe, G. 2008. An improved Agrobacterium-mediated transformation method for banana and plantain (*Musa* spp.). PhD. Thesis, Katholic University of Leuven.158p.
- Arredondo, J.T. and H. Schnyder. 2003. Components of leaf elongation rate and their relationship to specific leaf area in contrasting grasses. *New Phytologist* 158:305-314.
- Atkinson, H.J., S. Grimwood, K. Johnson and J. Green. 1000. Prototype demonstration of transgenic resistance to the nematode *Radopholus similis* conferred on banana by a cystatin. *Transgenic Research* 13:135-142.
- Bardini, M., M. Labra, M. Winfield and F. Sala. 2003. Antibiotic-induced DNA methylation changes in callus of *Arabidopsis thaliana*. *Plant Cell, Tissue and Organ Culture* 72:157-162.
- Barroco, R.M., A. Pers, A-M. Droual, L. De Veylder, L-S-L. Nguyen, J. De Wolf, V. Mironov, R. Peerbolte, G.T.S. Beemster, D. Inzé, W.F. Broekaert and V. Frankard. 2006. The Cyclin-Dependent Kinase Inhibitor Orysa: KRP1 play an important role in seed development of rice. *Plant Physiology* 142:1053-1064.
- Basin, T.I. 2000. On the consistency of cell division rate in the root meristem. *Plant Molecular Biology* 43:545-554.
- Becker, D.K., B. Dugdale, M.K. Smith, R.M. Harding and J.L. Dale. 2000. Genetic transformation of Cavendish bananas (*Musa* spp. AAA group) cv. Grand Nain via microprojectile bombardment. *Plant Cell Report* 19:229-234.
- Beemster, G.T.S. and T.I. Baskin. 1998. Analysis of cell division and elongation underlying the developmental acceleration of root growth in *Arabidopsis thaliana*. *Plant Physiology* 116:1515-1526.
- Beemster, G.T.S., F. Fiorani and D. Inzé. 2003. Cell cycle: the key to plant growth control? *Trends in Plant Science* 8:154-158.

- Beemster G.T.S., V. Mironov and D. Inzé. 2005. Tuning the cell-cycle engine for improved plant performance. *Current Opinion in Biotechnology* 16:142-146.
- Black, A.R and J. Azizkhan-Clifford. 1999. Regulation of E2F: a family of transcription factors involved in proliferation control. *Gene* 237:281-302.
- Blomme, G., R. Swennen, A. Tenkouano, R. Ortiz and D. Vuylsteke. 2001. Estimation of root development from shoot traits in plantain and banana (*Musa* spp.). *InfoMusa* 10:15-17.
- Boucheron E, J.H.S. Healy, C. Bajon, A. Sauvanet, J. Rembur, M. Noin, M. Sekine, C. Riou Khamlichi, J.A.H. Murray, H. Van Onckelen, D. Chriqui. 2005. Ectopic expression of *Arabidopsis CYCD2* and *CYCD3* in tobacco has distinct effects on the structural organization of the shoot apical meristem. *Journal of Experimental Botany* 56:123-134.
- Brendel, V., J. Kleffe, J.C. Carle-Urioste, V. Walbot 1998. Prediction of splice sites in plant pre-mRNA from sequence properties. *Journal of Molecular Biology* 276:85-104.
- Brooker, R.J. 2009. Genetics: Analysis and Principles. 3rd Edition. McGraw Hill, Boston. 844pp.
- Brown, J.W.S. and C.G. Simpson 1998. Splice site selection in plant pre-mRNA splicing. *Annual Reviews of Plant Physiology* 49:77-95.
- Bultynck, L., F. Fiorani, E. Van Volkenburgh and H. Lambers. 2003. Epidermal cell division and cell elongation in two *Aegilops* species with contrasting leaf elongation rates. *Functional Plant Biology* 30:425-432.
- Bustin, S.A. 2000. Absolute quantification of mRNA using real-time reverse transcription polymerase chain reaction assays. *Journal of Molecular Endocrinology* 25:169-193.
- Bustin, S.A., V. Benes, J.A. Garson, J. Hellemans, J. Huggett, M. Kubista, R. Mueller, T. Nolan, M.N. Pfaffl, G.L. Shiply, J. Vandesompele and C.T. Wittwer. 2009. The MIQE guidelines: Minimum information for publication of quantitative real-time PCR experiments. *Clinical Chemistry* 55:611-622.
- Cheng, M., B.A. Lowe, M. Spencer, X. Ye and C.L. Armstrong. 2004. Factors influencing Agrobacterium-mediated transformation of monocotyledonous species. *In vitro Cell and Developmental Biology Plant* 40:31-41.

- Chowdhury, M.K.U., G.K.A. Parvez and N.M. Saleh. 1997. Evaluation of five promoters for use in transformation of oil palm (*Elaeis guineensis* Jacq.). Plant Cell Reports 16:277-281.
- Cockcroft C E, B.G.W. den Boer, J.M.S Healy and J. A.H. Murray. 2000. CyclinD control of growth rate in plants. Nature 405:575-579.
- Coelho, C.M., R.A. Dante, P.A. Sabelli, Y. Sun, B.P. Dilkes, W.J. Gordon Kamm and B.A. Larkins. 2005. Cyclin-dependent kinase inhibitors in Maize endosperm and their potential role in endoreduplication. Plant Physiology 138:323-2336.
- Cote, F.X., R. Domergue, S. Monmarson, J. Schwendiman, C. Teisson and J.V. Escalant. 1996. Embryogenic cell suspensions from the male flower of *Musa* AAA cv. Grand Nain. Physiologia Plantarum 97:285-290.
- Crouch, J.H., D. Vuylsteke, R. Ortiz. 1998. Perspectives on the application of biotechnology to assist the genetic enhancement of plantain and banana (*Musa* spp.). Electronic Journal of Biotechnology 1:1-13.
- Dahl, M., I. Meskiene, L. Biigre, D.T.C. Ha, I. Swoboda, R. Hubmann, H. Hirt and E. Heberle-Bors. 1995. The D-type alfalfa cyclin gene cycMs4 complements G1 cyclin deficient yeast and is induced in the G1 phase of the cell cycle. The Plant Cell 7:1847-1857.
- Dai, S., P. Zheng, P. Marmey, S. Zhang, W. Tian, S. Chen, R.N. Beachy and C. Fauquet. 2001. Comparative analysis of transgenic rice plants obtained by *Agrobacterium* mediated transformation and particle bombardment Molecular Breeding 7:25-33.
- Dellaporta, S.L., J. Wood and J.B. Hicks. 1983. A plant DNA mini preparation: version II. Plant Mol Biol. Report 4:91-21.
- DeSalle, L.M and M. Pagano. 2001. Regulation of the G1 to S transition by the ubiquitin pathway. Federation of European Biochemical Society Letters 490:179-189.
- De Veylder, L., T. Beeckman, G.T.S. Beemster, J. Engler, S. Ormenese, S. Maes, M. Naudts, E. Van Der Schueren, A. Jacqmard, E. Engler and D. Inzé. 2002. Control of proliferation, endoreduplication and differentiation by the *Arabidopsis* E2Fa-DPa transcription factor. The EMBO Journal 21:1360-1368.

- De Veylder, J. A. Engler, S. Burssens, A. Manevski, B. Lescure, M. Van Montagu, G. Engler and D. Inzé. 1999. A new D-type cyclin of *Arabidopsis thaliana* expressed during lateral root primordial formation. *Planta* 208:453-462.
- De Veylder, L., J. Joubes and D. Inzé. 2003. Plant cells cycle transitions. *Current Opinion in Plant Biology* 6:536-543.
- Dewitte, W. and J.A. Murray. 2003. The plant cell cycle. *Annual Review of Plant Biology* 54:235-264.
- Dewitte, W., C. Riou-Khamlichi, S. Scofield, J.M.S. Healy, A. Jacqmard, N.J. Kilby and J.A.H. Murray. 2003. Altered cell cycle distribution, hyperplasia, and inhibited differentiation in *Arabidopsis* caused by the D-type cyclin *CycD3*. *The Plant Cell* 15:79-92.
- Dietz-Pfeilstetter, A. 2010. Stability of transgene expression as a challenge for genetic engineering. *Plant Science* 179:164-167.
- Dickman, M.B. 2004. Can model plants help banana improvement through biotechnology? *InfoMusa* 13:6-9.
- Doerner, P.W. 1994. Cell cycle regulation in plants. *Update on Cell Biology* 106:823-827.
- Doerner, P., J-E. Jorgensen, R. You, J. Steppuhn and C. Lamb. 1996. Cyclin expression limits root growth and development. *Nature* 308:520-523.
- Dombrowski, J.E. and R.C. Martin. 2009. Evaluation of reference genes for quantitative RT-PCR in *Lonlium temulentum* under abiotic stress. *Plant Science* 176:390-396.
- Dosselaere, N., M. Araya and D. De Waele. 2003. Effect of pot volume on root growth, *Radopholus similis* reproductive potential and its damage on bananas. *InfoMusa* 12:17-21.
- Down, R.E., L. Ford, S.J. Bedford, L. N. Gatehouse, C. Newell, J.A. Gatehouse and A.M.R. Gatehouse. 2001. Influence of plant development and environment on transgene expression in potato and consequences for insect resistance. *Transgenic Research* 10:223-236.
- Efenden, C.M., L. Temple and K. Tomekpe. 2003. Varietal selection by farmers in central Cameroon. *InfoMusa* 12:4-8.
- Filipecki, M. and S. Malepszy. 2006. Unintended consequences of plant transformation: a molecular insight. *Journal of Applied Genetics* 47:277-286.

- Fiorani, F., G.T.S. Beemster, L. Bultynck and H. Lambers. 2000. Can meristematic activity determine variation in leaf size and elongation rate among four *Poa* species? A kinematic study. *Plant Physiology* 124:845-855.
- Freeman D., C. Riou-Khamlichi, E.A. Oakenfull and J.A.H. Murray. 2003. Isolation, characterization and expression of cyclin and cyclin-dependent kinase genes in Jerusalem artichoke (*Helianthus tuberosus* L.). *Journal of Experimental Botany* 54:303-308.
- Frohman, M.A., M. K. Dush and G.R. Martin. 1988. Rapid production of full length cDNAs from rare transcripts: Amplification using a single gene specific oligonucleotide primer. *PNAS* 85:8998-9002.
- Gaidashova, S.V., S.H.O. Okech, C.S. Gold and I. Nyagahungu. 2005. Why beer bananas? The case for Rwanda. *InfoMusa* 14:2-6.
- Gaj, M. 2004. Factors influencing somatic embryogenesis induction and plant regeneration with particular reference to *Arabidopsis thaliana* (L) Heynh. *Plant Growth Regulation* 43:27-47.
- Ganapathi, T.R., N.S. Higgs, P.J. Balint-Kurti, C.J. Arntzen, G.D. May and J.M. Van Eck. 2001. Agrobacterium-mediated transformation of the embryogenic cell suspensions of the banana cultivars Rasthali (AAB). *Plant Cell Reports* 20:157-162.
- Gaudin, V., P.A. Lunness, P.R. Fobert, M. Towers, C. Riou-Khamlichi, J.A.H. Murray, E. Coen and J.H. Doonan. 2000. The expression of D-cyclin genes defines distinct developmental zones in snapdragon apical meristems and is locally regulated by the *Cycloidea* gene. *Plant Physiology* 122:1137-1148.
- Gelvin, S.B. 2003. Agrobacterium-mediated plant transformation: the biology behind the “gene-jockeying” tool. *Microbiology and Molecular Biology Reviews* 67:16-37.
- Genschik, P., M.C. Criqui, Y. Parmentier, A. Derevier and J. Fleck. 1998. Cell cycle dependent proteolysis in plants: Identification of the destruction box pathway and metaphase arrest produced by the proteasome inhibitor MG132. *The Plant Cell* 10:2063-2075.
- Ginzinger, D.G. 2003. Gene quantification using real-time quantitative PCR: an emerging technology hits the mainstream. *Experimental Hematology* 30:503-512.

- Gowen, S.R. 1996. The source of nematode resistance, the possible mechanisms and the potential for nematode tolerance in *Musa*, p. 45-49. In: De Waele, D., Frison E.A., Horry, J.P. (eds.). New frontiers in resistance breeding for nematode, Fusarium and Sigatoka, INIBAP, Montpellier, France.
- Granier, C. and F. Tardieu. 1999. Water deficit and spatial pattern of leaf development: variability in response can be simulated using a simple model of leaf development. *Plant Physiology* 119:609-620.
- Granier, C., O. Turc and F. Tardieu. 2000. Coordination of cell division and tissue expansion in sunflower, tobacco and pea leaves: dependence or independence of both processes? *Journal of Plant Growth and Regulators* 19:45-54.
- Green, P.B. 1976. Growth and cell pattern formation on an axis: Critique of concepts, terminology, and modes of study. *Botany Gazette* 137:187-202.
- Greenplate, J.T. 1999. Quantification of *Bacillus thuringiensis* insect control protein *Cry1Ac* over time in Bollgard cotton fruit and terminals. *Journal of Economic Entomology* 92:1377-1383.
- Guo, J. and M.H. Wang. 2008. Transgenic tobacco plants overexpressing the *Nicta;CycD3;4* gene demonstrate accelerated growth rates. *BMB Reports* 542-547.
- Guo, J., J. Song, F. Wang and X.S. Zhang. 2007. Genome-wide identification and expression analysis of rice cell cycle genes. *Plant Molecular Biology*. 64:349-360.
- Hartley, J.L., G.F. Temple and M.A. Brasch. 2000. DNA cloning using *in vitro* site specific recombination. *Genome Research* 10:1788-1795.
- Hata, S., H. Kouchi, I. Suzuka and T. Ishii. 1991. Isolation and characterization of cDNA clones for plant cyclins. *The EMBO Journal* 10:2681-2688.
- Hauser, H and P. Van Asten, 2010. Methodological considerations on banana (*Musa* spp.) yield determination. *Acta Horticulturae* 879:433-444.
- Hirt, H., M. Mink, M. Pfosser, L. Bogre, J. Gyorgvey, C. Jonak, A. Gartner, D. Dudits and E. Heberle-Bors. 1992. Alfalfa cyclins: differential expression during the cell cycle and plant organs. *The Plant Cell* 4:1531-1538.
- Hu, T., S. Metz, C. Chay, H.P. Zhou, N. Biest, G. Chen, M. Cheng, X. Feng, M. Radionenko, F. Lu and J. Fry. 2003. Agrobacterium-mediated large scale transformation of wheat (*Triticum aestivum*) using glyphosate selection. *Plant Cell Report* 21:1010-1019.

- Hu, X., X. Cheng, H. Jiang, S. Zhu, B. Cheng and Y. Xiang. 2010. Genome-wide analysis of cyclins in maize (*Zea mays*). *Genetics and Molecular Research* 9:1490-1503.
- Huggett, J., K. Dheda, S. Bustin and A. Zumla. 2005. Real-time RT-PCR normalization; strategies and considerations. *Genes and Immunity* 6:279-284.
- Inzé, D. 2005. Green light for the cell cycle. *The EMBO Journal* 24:657-662.
- Inzé, D. and L. De Veylder. 2006. Cell cycle regulation in plant development. *Annual Review in Genetics* 40:77-105.
- Jain, S.M. 2011. In vitro mutagenesis in banana (*Musa* spp.) improvement. *Acta Horticulturae* 879:605-613.
- Jalil, A., N. Khalid, R.Y. Othman. 2003. Plant regeneration from embryogenic suspension cultures of *Musa acuminata* cv. Mas (AA). *Plant Cell Tissue and Organ Culture* 75:209-214.
- Jang, S.J., S.H. Shin, S.T. Yee, B. Hwang, K.H. Im and K.Y. Park. 2005. Effects of abiotic stresses on cell cycle progression in tobacco BY-2 cells. *Molecules and Cells* 20:136-141.
- Kanno, T., S. Naito and K. Shimamoto. 2000. Post-transcriptional gene silencing in cultured rice cells. *Plant Cell Physiology* 41:321-326.
- Karamura, D., B. Mugenzi, E. Karamura and S. Sharrock. 2004. Exploiting indigenous knowledge for the management and maintenance of biodiversity on farm. *African Crop Science Journal* 12:68-74.
- Karimi, M., B. De Meyer and P. Hilson. 2005. Modular cloning in plant cells. *Trends in Plant Science* 10:103-105.
- Kavanova, M. F.A. Lattanzi, A.A. Grimoldi and H. Schnyder. 2006. Phosphorus deficiency decreases cell division and elongation in grass leaves. 2006. *Plant Physiology* 141:766-775.
- Khalil, S.M., K.T. Cheah, E.A. Perez, D.A. Gaskill and J.S. Hu. 2002. Regeneration of banana (*Musa* spp. AAB cv. Dwarf Brazilian) via secondary somatic embryogenesis. *Plant Cell Report* 20:1128-1134.
- Khanna, H., D. Becher, J. Kleidon and J. Dale. 2004. Centrifugation assisted Agrobacterium tumefaciens-mediated transformation (CAAT) of embryogenic cell suspensions of banana (*Musa* spp. Cavendish AAA and Lady finger AAB). *Molecular Breeding* 14:239-252.

- Koroleva, O.A., M. Tomlinson, P. Parinyapong, L. Sakvarelidze, D. Leader, P. Shaw and J.H. Doonana. 2004. *CycD1*, a putative G1 cyclin from *Antirrhinum majus*, accelerates the cell cycle in cultured tobacco BY-2 cells by enhancing both G1/S entry and progression through S and G2 phases. *The Plant Cell* 16:2364-2379.
- Kumar, N., V. Krishnamoorthy, L. Nalina and K. Soorianathasundaram. 2002. A new factor for estimating total leaf area in banana. *InfoMusa* 11:42-43.
- Kumar, S., K. Tamura and M. Nei. 2004. MEGA3: Integrated software for molecular evolutionary genetics analysis and sequence alignment. *Brief Bioinform* 5:150-163.
- Kvarneden, A., J.L. Yao, X. Zhan, I. O'Brien and B.A.M. Morris. 2000. Isolation of three distinct cycD3 genes expressed during fruit development in tomato. *Journal of Experimental Botany* 51:1789-1797.
- Lakshminarayan, M.I., S.P. Kumatha, M.B. Chandrasekharan and C.T. Hall. 2000. Transgene silencing in monocots. *Plant Molecular Biology* 43:323-346.
- Lee J., A. Das, M. Yamaguchi, J. Hashimoto, N. Tsutsumi, H. Uchimiya and M. Umeda. 2003. Cell cycle function of rice B2-type cyclin interacting with a B type cyclin dependent kinase. *The Plant Journal* 34:417-425.
- Lechtenberg, B., D. Schubert, A. Forsbach, M. Gils and R. Schmidt. 2003. Neither inverted repeat T-DNA configurations nor arrangements of tandemly repeated transgenes are sufficient to trigger transgene silencing. *The Plant Journal* 34:507-517.
- Lecompte, F., H. Ozier-Lafontaine and L. Pages. 2002. An analysis of growth rates and directions of growth of primary roots of field-grown banana trees in andisol at three levels of soil compaction. *Agronomie* 23:209-218.
- Lindsey, K. and P. Gallois 1990. Transformation of sugar beet (*Beta vulgaris*) by *Agrobacterium tumefaciens*. *Journal of Experimental Botany* 41:529-536.
- Livak, K.J. and T.D. Schmittgen. 2001. Analysis of relative gene expression data using real time quantitative PCR and the $2^{-\Delta\Delta CT}$ method. *Methods* 25:402-408.
- MacAdam, J.W., J.J. Volence and C.J. Nelson. 1989. Effects of nitrogen on mesophyll cell division and epidermal cell elongation in tall Fescue leaf blades. *Plant Physiology* 89:549-556.
- Magnani, E., L. Bartling and S. Hake. 2006. From Gateway to multisite gateway in one recombination event. *BMC Molecular Biology* 7:46.

- Magyar, Z., T. Meszaros, P. Miskolczi, M. Deak, A. Faher, S. Brown, E. Kondorosi, A. Athanasiadis, S. Pongor, M. Bilgin, L. Bako, C. Koncz and D. Dudits. 1997. Cell cycle phase specificity of putative cyclin dependent kinase variants in synchronized alfalfa cells. *The Plant Cell* 9:223-235.
- Makumbi, D. 1995. Uganda Highland Banana Germplasm Evaluation. M.Sc. Thesis, Makerere University. 80 pp.
- Marone, M., S. Mozzetti, D. De Ritis, L. Pierelli and G. Scambia. 2001. Semi quantitative RT-PCR analysis to assess the expression levels of multiple transcripts from the same sample. *Biological Procedures Online* Volume 3. www.biologicalprocedures.com.
- Martins, C.M., G. Beyene, J-L. Hofs, K. Kruger, C. Van der Vyver, U. Schluter and K.J. Kunert. 2008. Effect of water-deficit stress on cotton plants expressing the *Bacillus thuringiensis* toxin. *Annals of Applied Biology* 152:255-262.
- Masubelele, N.H., W. Dewitte, M. Menges, S. Maughan, C. Collins, R. Huntley, J. Nieuwland, S. Scofield and J.A.H. Murray. 2005. D-type cyclins activate division in the root apex to promote seed germination in *Arabidopsis*. *PNAS* 102:15694-15699.
- Matzke, M.A. and A.J.M. Matzke. 1995. How and why do plants inactivate homologous (trans)genes? *Plant Physiology* 107:679-685.
- May, G.D., R. Afza, H. S. Mason, A. Wiecko, F. J. Novak and C. J. Arntzen. 1995. Generation of transgenic banana (*Musa acuminata*) plants via *Agrobacterium* mediated transformation. *Biotechnology* 13:486-492.
- Meijer, M. and J.A.H. Murray. 2000. The role and regulation of D-type cyclin in the plant cell cycle. *Plant Molecular Biology* 43:621-633.
- Mehlich, A. 1984. Mehlich 3 soil extractant: A modification of Mehlich 2 extractant. *Communication in soil science and plant analysis* 15:1409-1416.
- Menges, M., G. Pavesi, P. Morandini, Laszlo Bogre and J.M.H. Murray. 2007. Genomic organization and evolutionary conservation of plant D-type cyclins. *Plant Physiology* 145:1558-1576.
- Meyer, P. 1995. Variation of transgene expression in plants. *Euphytica* 85:359- 366.
- Mironov, V., L. De Veylder, M, Van Montagu and D. Inzé. 1999. Cyclin dependent kinases and cell division in plants-The Nexus. *The plant Cell* 11:505-521.

- Murashige, T. and F.A. Skoog. 1962. A revised medium for rapid growth and bioassay with tobacco tissue cultures. *Physiologia Plantarum* 15:473-497.
- Muskens, M.W.M., A.P.A. Vissers, J.N.M. Mol and J.M. Kooter. 2000. Role of inverted DNA repeats in transcriptional and post-transcriptional gene silencing. *Plant Molecular Biology* 43:243-260.
- Namasivayam, P. 2007. Acquisition of embryogenic competence during somatic embryogenesis. *Plant Cell Tissue and Organ Culture* 90:1-8.
- Nitsch, J.P. and C. Nitsch. 1969. Haploid plants from pollen grains. *Science* 163:85-87.
- Oakenfull, E.A., C. Riou-Khamlichi and J.A.H. Murray. 2002. Plant D-type cyclins and the control of G1 progression. *Philosophical Transactions. The Royal Society* 357:749-760.
- Oh, S-J., S-J. Kim, Y.S. Kim, S-H. Park, S-H. Ha and J-K. Kim. 2008. *Arabidopsis cyclinD2* expressed in rice forms a functional cyclin dependent kinase complex that enhances seedling growth. *Plant Biotechnology Report* 2:227-231.
- Okalebo, J.R., K.W. Gathua and P.L. Woomer. 2002. Laboratory methods of soil and plant analysis. A working manual. 2nd Edition, 128 pp.
- Ortiz, R. and D. Vuylsteke. 1998a. BITA-3: A starchy banana with partial resistance to Black Sigatika and tolerance to streak virus. *HortScience* 33:358-359.
- Ortiz, R. and D. Vuylsteke. 1998b. PITA-14: A Black Sigatika-tetraploid plantain hybrid with virus tolerance. *HortScience* 33:360-361.
- Ortiz, R., D. Vuylsteke, H. Crouch and J. Crough. 1998. TM3x: Triploid Black Sigatoka resistant *Musa* hybrid germplasm. *HortScience* 33:362-365.
- Peirson, S.N., J.N. Butler and R.G. Foster. 2003. Experimental validation of novel and conventional approaches to quantitative real-time PCR data analysis. *Nucleic Acids Research* 31:1-7.
- Pierik, R.L.M. 1987. In vitro culture of higher plants. Martinus Nijhoff Publishers, Boston. 344 pp.
- Pillay M., D.C. Nwakanma, A.Tenkouano. 2000. Identification of RAPD markers linked to A and B genome sequences in *Musa* L. *Genome* 43:763-767.
- Pillay, M., A. Tenkouano and J. Hartman. 2002. Bananas and plantains: Future challenges in *Musa* breeding, p. 223-252. In: Manjit, S. Kang (ed.). *Crop improvement challenges in the twenty first century*. Haworth Press, Inc, New York.

- Pillay, M., R. SSebuliba, J. Hartman, D. Vuylsteke, D. Talengera and W. Tushemereirwe, 2004. Conventional breeding strategies to enhance the sustainability of *Musa* biodiversity conservation for endemic cultivars. African Crop Science Journal 12:63-69.
- Potenza, C., L. Aleman and C. Sengupta-Gopalan. 2004. Targeting transgene expression in research, agricultural and environmental applications: promoters used in plant transformation. In vitro Cell and Development Biology Plant 40:1-22.
- Primrose, S.B. and R.M. Twyman. 2006. Principles of gene manipulation and genomics. 7th Edition. Plackwell Publishers. 644 pp.
- Purseglove, J.W. 1972. Tropical Crops: Monocotyledons Volume 1 and 2 combined. Longman, Essex. 607 pp.
- Qi, R. and P.C.L. John. 2007. Expression of genomic AtCYCD2;1 in Arabidopsis induces cell division at smaller cell sizes: Implications for the control of plant growth. Plant Physiology 144:1587-1597.
- Rechsteiner, M. and W. Rogers. 1996. PEST sequences and regulation by proteolysis. TIBS 267-271.
- Reddy, A.S.N. 2007. Alternative splicing of pre-messenger RNAs in plants in the genome era. Annual Reviews of Plant Biology 58:267-294.
- Renaudin, J-P, J.H. Doonan, D. Freeman, J. Hashimoto, H. Hirt, D. Inzé, T. Jacobs, H. Kouchi, P. Rouze, M. Sauter, A. Savoure, D.A. Sorrell, V. Sundaresan and J.A.H. Murray. 1996. Plant cyclins: a unified nomenclature for plant A-, B- and D-type cyclins based on sequence organization. Plant Molecular Biology 32:1003-1018.
- Reuveni, O. 1990. Methods for detecting somaclonal variants in 'Williams' bananas, p.108-113. In: Jarret, R.L. (ed.). Identification of genetic diversity in the genus *Musa*. Procof an Intl workshop, Los Banos, Philippines, 5-10 September 1988.
- Riou-Khamlich, C., R. Huntley, A. Jacqmard, and J.A.M. Murray. 1999. Cytokinin activation of Arabidopsis cell division through a D-type cyclin. Science 283:1541-1544.
- Riou-Khamlich, C., M. Menges, J.M.S. Healy and J.A.H. Murray. 2000. Sugar control of the plant cell cycle: Differential regulation of Arabidopsis D type cyclin gene expression. Molecular and Cellular Biology 20:4513-4521.
- Rishi, A.S., N.D. Nelson and A. Goyal. 2004. Genome walking of large fragments: an improved method. Journal of Biotechnology 11:9-15.

- Rose, A.B. and Beliakoff, J.A. 2000. Intron mediated enhancement of gene expression independent of unique intron sequence and splicing. *Plant Physiology* 22:535-542.
- Rost, T.L. and J.A. Bryant. 1996. Root organization and gene expression patterns. *Journal of Experimental Botany* 47:1613-1628.
- Roux, N.S. Mutation induction in *Musa*. 2004. P. 23-32. In: Jain, S.M and Swennen, R. (eds.). *Banana improvement: Cellular, molecular biology, and induced mutation*. Science Publishers, New Hampshire, USA. 382 pp.
- Rowe, P. and F. Rosales. 1993. Diploid breeding at FHIA and the development of Goldfinger. *InfoMusa* 2:9-11.
- Rymen B, F. Fiorani, F. Kartal, K. Vandepoele, D. Inzé and G.T.S Beemster. 2007. Cold nights impair leaf growth and cell cycle progression in maize through transcriptional changes of cell cycle genes. *Plant Physiol* 143:1429-1438.
- Sacks, M.M., W.K. Silk and P. Burman. 1997. Effect of water stress on cortical cell division rates within the apical meristem of primary roots of maize. *Plant Physiology* 114:519-527.
- Sagi, L., S. Remy, B. Panis, R. Swennen and Volckaert. 1994. Transient gene expression in electroporated banana (*Musa* spp., cv. 'Bluggoe'. ABB group) protoplasts isolated from regenerable embryogenic cell suspensions. *Plant Cell Reports* 13:262-266.
- Sagi, L., B. Panis, S. Remy, H. Schoofs, K. De Smet, R. Swennen and B. P.A. Cammue. 1995. Genetic transformation of banana and plantain (*Musa* spp.) via particle bombardment. *Biotechnology* 13:481-485.
- Salvo-Garrodo, H., S. Travella, L.J. Bilham, W.A. Harwood and J.W. Snape. 2004. The distribution of transgene insertion sites in barley determined by physical and genetic mapping. *Genetics* 167:1371-1379.
- Sambrook, J., E.F. Fritsch and T. Maniatis. 1989. *Molecular cloning: A laboratory Manual*. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.
- Schnittger, A., U. Schobinger, D. Bouyer, C. Weinl, Y.D. Stierhof and M. Hulskamp. 2002. Ectopic D-type cyclin expression induces not only DNA replication but also cell division in *Arabidopsis* trichomes. *PNAS* 99:6410-6415.
- Sharma, K.K. and R. Ortiz. 2000. Program for the application of genetic transformation for crop improvement in the semi-arid tropics. In *Vitro Cellular Development Biology Plant* 36:83-92.

- Shen, W-H. 2002. The plant E2F-Rb pathway and epigenic control. *Trends in Plant Science* 7:505-511.
- Siebert, P.D., A. Chenchick, D.E. Kellogg, K.A. Lukyanov and S.A. Lukyanov. 1995. An improved PCR method for walking in uncloned genomic DNA. *Nucleic Acids Research* 23:1087-1088.
- Simmonds, N.M. 1962. The evolution of the bananas. Longmans, London. 170 pp.
- Soni, R., J.P. Carmicheal, Z.H. Shah and J.A.H. Murray. 1995. A family of cyclin D homologs from plants differentially controlled by growth regulators and containing the conserved retinoblastoma protein interaction motif. *Plant Cell* 7:85-103.
- Sorrell, D.A., B. Combettes, N. Chaubet-Gigot, C. Gigot and J.A.H. Murray. 1999. Distinct cyclinD genes show mitotic accumulation or constant levels of transcripts in tobacco Bright Yellow-2 Cells. *Plant Physiology* 119:343-351.
- Sreeramanan S, Maziah M, Abdullah M P, Rosli N M and Xavier R. 2006. Potential selectable marker for genetic transformation in banana. *Biotechnology* 5:189-197.
- Ssebuliba R.N., P. Rubaihayo, A. Tenkouano, D. Makumbi, D. Talengera and M. Magambo. 2005. Genetic diversity among East African highland bananas for female fertility. *African Crop Science Journal* 13:13-26.
- Stals, H. and D. Inzé, 2001. When plant cells decide to divide. *Trends in Plant Science* 6:259-364.
- Stam, M., J.N.M. Mol and J.M. Kooter. 1997. The silence of genes in transgenic plants. *Annals of Botany* 79:3-12.
- Statistical analysis system (SAS), 2002, Institute Inc., Cary. NC, USA.
- Stover, R.H. 2000. Diseases and other banana health problems in tropical Africa. *Acta Horticulturae* 540:311-317.
- Stover, N. W. and R. H. Simmonds 1987. Bananas, Longman, Essex, England. 468pp.
- Strosse, H., R. Domergue, B. Panis, J.V. Escalant and F. Cote. 2003. Banana and plantain embryogenic cell suspensions, p. 58-62. In: Vezina, A. and Picq, C. (eds.), INIBAP. Technical Guidelines 8. INIBAP Montpellier.
- Strosse, H., I. Van den Houwe and B. Panis. 2004. p.1-12. In: Jain, S.M and Swennen, R. (eds.). Banana improvement: Cellular, molecular biology, and induced mutation. Science Publishers, Inc, Enfield, USA. 382 pp.

- Sun, Y., B.P. Dilkes, C. Zhang, R.A. Dante, N.P. Carneiro, K.S. Lowe, R. Jung, W.J.Gordon-Kamm and B.A. Larkins. 1999. Characterization of maize (*Zea mays* L.) Wee1 and its activity in developing endosperm. PNAS 96:4180-4185.
- Swennen, R. and E. De Langhe. 1985. Growth parameters of yield of plantain (*Musa* cv. AAB). Annals of Botany 197-204.
- Swennen, R and D. Vuylsteke 2001. Banana *Musa* L, p.530-552. In: Raemaekers, R.H. (Ed.) Crop production in Tropical Africa, Goekint Graphics, Belgium.
- Taiz, L. and E. Zeiger. 2006. Plant Physiology, 3rd Edition. Sinauer Associates, Inc., Publishers. 690 pp.
- Talengera, D., G.T.S. Beemster, F. Fabio, D. Inzé, K. Kunert and W.K. Tushemereirwe. 2010. Transformation of banana (*Musa* spp.) with a D type cyclin gene from *Arabidopsis thaliana* (*Arath;CYCD2;1*). Aspects of Applied Biology 96:45-53.
- Tang, W., R.J. Newton and D.A. Weidner. 2007. Genetic transformation and gene silencing mediated by multiple copies of a transgene in white pine. Journal of Experimental Botany 58:545-554.
- Tenkouano, A., R. Ortiz and D. Vuylsteke. 1998. Combining ability for yield and plant phenology in plantain-derived populations. Euphytica 104:151-158.
- Tripathi, L., H. Mwaka, J.N. Tripathi and W.K. Tushemereirwe. 2010. Expression of sweet pepper *Hrap* gene in banana enhances resistance to *Xanthomonas campestris* pv. *Musacearum*. Molecular Plant Pathology 1-11.
- Tripathi, L., J.N. Tripathi and W.K. Tushemereirwe. 2008. Rapid and efficient production of transgenic East African highland banana (*Musa* spp.) using intercalary meristematic tissues. African Journal of Biotechnology 7:1438-1445.
- Van Asten, P.J.A., C.S. Gold, S.H. Okech, S.V. Gaiaashova, W.K. Tushemereirwe and D. De Waele. 2004. Soil quality problems in East African banana systems and their relation with other yield loss factors. InfoMusa 13:20-25.
- Vandepoele, K., J. Raes, L. De Veylder, P. Rouze, S. Rombauts and D. Inzé. 2002. Genome wide analysis of core cell cycle genes in *Arabidopsis*. The Plant Cell 14:903-916.
- Van Harten, A.M. 1998. Mutation breeding: theory and practical applications. Cambridge University Press, Cambridge, 355 pp.

- Vanneste, S., L. Maes, I. De Smet, K. Himanen, M. Naudts, D. Inzé and T. Beeckman. 2005. Auxin regulation of cell cycle and its role during lateral root initiation. *Physiologia Plantarum* 123:136-146.
- Veluthambi, K., A.K. Gupta and A. Sharma. 2003. The current status of plant transformation technologies. *Current Science* 84:368-380.
- Vlieghe K, M. Vuylsteke, K. Florquin, S. Rombauts, S. Maes, S. Ormenese, P. Van Hummelen, Y. Van de Peer, D. Inzé and L. De Veylder. 2003. Microarray analysis of E2Fa-Dpa overexpressing plants uncovers a cross-talking genetic network between DNA replication and nitrogen assimilation. *Journal of Cell Science* 116:4249-4259.
- Vuylsteke, D., R. Ortiz and S. Ferris 1993. Genetic and agronomic improvement for sustainable production of plantain and banana in Sub-Saharan Africa. *African Crop Science Journal* 1:1-8.
- Vuylsteke, D. and D. Talengera. 1998. Postflask management of micropropagated bananas and plantains. A manual on how to handle tissue-cultured banana and plantain plants. IITA, 15 pp.
- Vuylsteke, D., R.L. Swennen and R. Ortiz. 1993. Development and performance of black Sigatoka-resistance tetraploid hybrids of plantain (*Musa* spp., AAB group). *Euphytica* 65:33-42.
- Walter, A., W.K. Silk and U. Schurr. 2009. Environmental effects on spatial and temporal patterns of leaf and root growth. *Annual Review of Plant Biology* 60:279-304
- Wang, H., Q. Qi, P. Schorr, A.J. Cutler, W.L. Crosby and L.C. Fowke. 1998. ICK1, a cyclin dependent protein kinase inhibitor from *Arabidopsis thaliana* interacts with both Cdc2a and CycD3, and its expression is induced by abscisic acid. *The Plant Journal* 15:501-510.
- Wang, H., Y. Zhou, S. Gilmer, S. Whitwill and L.C. Fowke. 2000. Expression of the plant cyclin-dependent kinase inhibitor ICK1 affects cell division, plant growth and morphology. *The Plant Journal* 24:613-623.
- Wang, G., H. Kong, Y. Sun, X. Zhang, W. Zhang, N. Altman, C. W. dePamphilis and H. Ma. 2004. Genome-wide analysis of the cyclin family in *Arabidopsis* and comparative phylogenetic analysis of plant cyclin-like proteins. *Plant Physiology* 135:1084-1099.

- Wayne, M.B., L.J. Kleinsmith, J. Hardin and G.P. Berton. 2009. The world of the cell, 7th Edition. Benjamin Cummings Publishers. 912 pp.
- Weinert, T. 1998. DNA damage checkpoints update: getting molecular. Current Opinion in Genetics and Development 8:185-193.
- West, G., D. Inzé and G.T.S. Beemster. 2004. Cell cycle modulation in the response of the primary root of *Arabidopsis* to salt stress. Plant Physiology 135:1050-1058.
- Wilmink, A. and J.J.M. Dons. 1993. Selective agents and marker genes for use in transformation of monocotyledonous plants. Plant Molecular Biology Reporter 11:165-185.
- Yoshida, K. and A. Shinmyo. 2000. Transgene expression systems in plant, a natural bioreactor. Journal of Bioscience and Bioengineering 90: 353-362.



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

APPENDICES

Appendix I. Medium (MA2) used for maintaining banana cell suspension.

Group	Component	mg/L
MS macro nutrients	NH ₂ NO ₂	1,650
	KNO ₃	1,900
	CaCl ₂	332.2
	MgSO ₄	180.7
	KH ₂ PO ₄	170
MS micro nutrients	MnSO ₄	15.1
	H ₃ BO ₃	6.2
	ZnSO ₄ .7H ₂ O	8.6
	KI	0.83
	Na ₂ MoO ₄ .2H ₂ O	0.25
	CuSO ₄ .5H ₂ O	0.025
	CoCl ₂ .6H ₂ O	0.025
Iron complex	FeSO ₄ .7H ₂ O	27.9
	Na ₂ EDTA.2H ₂ O	37.3
Vitamins	Glycine	2.0
	Thiamine-HCl	0.5
	Pyridoxine-HCl	0.5
	Nicotinic acid	0.5
	Ascorbic acid	40
	Myo-inostol	100
	L-Glutamine	99.4
	Malt extract	100
	Biotin	1.0
Phytohormones	2,4-D	1.0
Carbon source	Sucrose	45,000
	pH	5.3

Appendix II. Medium used for re-suspending the Agrobacterium.

Group	Component	mg/L
Macro nutrients	NH ₂ NO ₂	165.0
	KNO ₃	190.0
	CaCl ₂	33.2
	MgSO ₄	18.1
	KH ₂ PO ₄	17.0
Micro nutrients	MnSO ₄	15.1
	H ₃ BO ₃	6.2
	ZnSO ₄ .7H ₂ O	8.6
	KI	0.83
	Na ₂ MoO ₄ .2H ₂ O	0.25
	CuSO ₄ .5H ₂ O	0.025
Iron complex	CoCl ₂ .6H ₂ O	0.025
	FeSO ₄ .7H ₂ O	27.9
	Na ₂ EDTA.2H ₂ O	37.3
Vitamins	Glycine	2.0
	Thiamine-HCl	10
	Pyridoxine-HCl	0.5
	Nicotinic acid	0.5
	Myo-inositol	50
	L-cystein	400
Carbon source	Sucrose	68,500
	Glucose	36,000
Gelling agent	Phytigel	2.3
Acetosyringone		49.0
	pH	5.3

Appendix III. Medium (MA3) used for inducing embryos development.

Group	Component	(mg/L)
SH macro nutrients	NH ₂ H ₂ PO ₄	300
	KNO ₃	12,500
	CaCl ₂ .2H ₂ O	200
	MgSO ₄ .7H ₂ O	400
SH micro nutrients	MnSO ₄ .4H ₂ O	10.0
	H ₃ BO ₃	5.0
	ZnSO ₄ .7H ₂ O	1.0
	KI	1.0
	Na ₂ MoO ₄ .2H ₂ O	0.1
	CuSO ₄ .5H ₂ O	0.2
	CoCl ₂ .6H ₂ O	0.1
Iron complex	FeSO ₄ .7H ₂ O	15.0
	Na ₂ EDTA.2H ₂ O	20.0
Vitamins	Glycine	2.0
	Thiamine-HCl	0.5
	Pyridoxine-HCl	0.5
	Nicotinic acid	0.5
	Ascorbic acid	40
	Myo-inositol	100
	L-Glutamine	100
	Malt extract	100
	Biotin	1.0
	L-Proline	230
Carbon source	Sucrose	45,000
	A-Lactose monohydrate	10
Phytohormones	NAA	0.2
	Zeatin	0.05
	Kinetin	0.1
	2ip	0.2
	Phytigel	3.0
Gelling agent	pH	5.8