
Curriculum Vitae

Charles H. Michler, Ph.D.
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INTERESTS Forest Genetics, In Vitro Culture, Genetic Modification

EDUCATION

B.S.	Landscape Horticulture/Architecture	1978	Ohio State University
M.S.	Horticulture/Physiology/Biochemistry	1981	Ohio State University
Ph.D.	Horticulture/Physiology/Biochemistry	1985	Ohio State University

AFFILIATIONS

Society of In Vitro Biology; International Association of Plant Tissue Culture; Sigma Xi; Indiana Hardwood Lumbermen's Association; National Hardwood Lumber Association; Indiana Forestry and Woodland Owners Association; Walnut Council

PROFESSIONAL ACTIVITIES AND RECOGNITION

AWARDS

1977 - Pi Alpha Xi – Landscape Horticulture and Floriculture Honorary

1979 – Sigma Xi – Agriculture Honorary

1979 – Academic Scholarship Award – Ohio Chapter of International Society of Arboriculture, Highest Grade Point Average.

1980 – Gamma Sigma Delta – Agricultural Honorary

1983 – Graduate Student Alumni Research Award, for best Ph.D. research proposal in all life sciences departments, Ohio State University.

1987 – Ohio Agricultural Research and Development Center Outstanding Ph.D. award.

1987 – Forest Service Certificate of Merit and Cash Award for development of herbicide tolerant poplars.

1988 – Sigma Alpha Epsilon National Award for scientific achievement in science, medicine, and technology.

1994 – North Central Forest Experiment Station Patent Award, for US Patent on production of herbicide tolerant poplar trees.

EDITOR Plant Breeding Reviews (2003-present)

SELECTED PUBLICATIONS

REFEREED JOURNALS

Michler, C.H., Lineberger, R.D., and G.W. Chism. 1986. A highly sensitive method for quantitative determination of abscisic acid. *Plant Physiology* 82:600-603.

Michler, C.H. and R.D. Lineberger. 1987. Effects of rapid cooling and survival of tobacco callus cultures. *Cryobiology*. 11:207-211

Michler, C.H. and R.D. Lineberger. 1987. Effects of light on somatic embryo development and abscisic acid levels in carrot suspension cultures. *Plant Cell, Tissue and Organ Culture*. 11(3):189-207.

Michler, C.H. 1988. Plant hormones and their role in plant growth and development. *Forest Science* 34(2):537.

Bauer, E.O. and C.H. Michler. 1989. Microspray applicator and enclosure for administering chemicals to plants. *HortScience* 24(4):704.

Michler, C.H. and E.O. Bauer. 1990. Genotypic variation of regeneration potential of hybrid poplars in vitro in response to plant hormones. *Canadian Journal of Forest Research* 20:1422-1428.

Michler, C.H. 1991. Biotechnology of woody environmental crops. *HortScience* 26(8):1042-1044.

Michler, C.H. and E.O. Bauer. 1991. High frequency somatic embryogenesis from leaf tissue of *Populus* spp. *Plant Science* 77:111-118.

Ostry, M., Hackett, W., Michler, C., Serres, R., and B. McCown. 1994. Influence of regeneration method and tissue source on the frequency of somatic variation in *Populus* to infection by *Septoria musiva*. *Plant Science* 97:209-215

Donahue, R.A., Davis, T.D., Michler, C.H., Riemenschneider, D.E., Carter, D.R., Marquardt, P.M., Sankhla, N., Sankla, D., Haissig, B.E. and J.G. Isebrands. 1994.

Growth, photosynthesis, and herbicide tolerance of genetically modified hybrid poplar. *Canadian Journal of Forest Research* 24:2377-2383.

Michler, C.H., Bauer, E.O., and Voelker, T.M.. 1994. In vitro selection of *Populus* with increased tolerance to sulfometuron methyl and glyphosate. *In Vitro Cellular and Developmental Biology-Plant* 30:204-209.

Pevalek-Kozlina, B., Michler, C.H., and Jelaska, S. 1995. Microclonal multiplication of wild cherry (*Prunus avium* L.) from shoot tips and root sucker buds. *Acta Bot. Croat.* 53:31-38.

Wu, H., Michler, C.H., and Davis, J.M.. 1999. The pine *Pschi4* promoter directs wound-induced transcription. *Plant Science* 142:199-207.

Mohamed, R., Meilan, R., Ostry, M.E., Michler, C.H., and Strauss, S.H. 2001. Bacterio-opsin gene overexpression fails to elevate fungal disease resistance in transgenic poplar (*Populus*). *Canadian Journal of Forest Research* 31:268-275.

Woeste, K., Burns, R., Rhodes, O. and Michler, C. 2002. Thirty polymorphic nuclear microsatellite loci from black walnut. *Journal of Heredity* 93(1): 58-60.

Davis, J.M., Wu, H., Cooke, J.E.K., Reed, J.M., Luce, K.S., and Michler, C.H. 2002. Pathogen Challenge, Salicylic Acid, and Jasmonic Acid Regulate Expression of Chitinase Gene Homologs in Pine. *Molecular Plant-Microbe Interactions*. 15(4): 380-387.

Michler, C.H. *Koelreuteria paniculata* laxm. 2002. In: Zasada, J. ed., *Seeds of Woody Plants in the United States*. USDA Forest Service Manual.

Aldrich, P.R., Michler, C.H., Sun, W., and Romero-Severson, J. 2002. Microsatellite markers for northern red oak (Fagaceae: *Quercus rubra*). *Molecular Ecology Notes*. 2:472-474.

Aldrich, P.R., Parker, G.R., Michler, C.H., and Romero-Severson, J. 2003. Whole-tree silvic identifications and the microsatellite genetic structure of a red oak species complex in an Indiana old-growth forest. *Canadian Journal of Forest Research*. 33:2228-2237.

Aldrich, P.R., Jagtap, M., Michler, C.H., and Romero-Severson, J. 2003. Amplification of North American Red Oak Microsatellite Markers in European White Oaks and Chinese Chestnut. *Silvae Genetica*. 52(3-4):176-179.

Romero-Severson, J., Aldrich, P., Feng, Y., Sun, W., and Michler, C.H. 2003. Chloroplast DNA variation of northern red oak (*Quercus rubra* L.) in Indiana. *New Forests*. 26:43-49.

Aldrich, P.R., Parker, G.R., Ward, J.S., and Michler, C.H. 2003. Spatial dispersion of trees in an old-growth temperate hardwood forest over 60 years of succession. *Forest Ecology and Management*, 180(1-3):475-491.

Aldrich, P.R., Glaubitz, J.C., Parker, G.R., Rhodes, O.E. Jr., and Michler, C.H. 2005. Genetic structure inside a declining red oak community in old-growth forest. *J. Heredity* 96(6):627-634.

Michler, C.H., Pijut, P.M., Meilan, R., Woeste, K.E., Jacobs, D.F. and Ostry, M.E. 2005. Improving disease resistance of butternut (*Juglans cinerea*), a threatened fine hardwood: a case for single tree selection through genetic improvement and deployment. *Tree Physiology* 26: 121-128.

Espinosa, C.A., Pijut, P.M., and Michler, C.H. 2006. Adventitious shoot regeneration and rooting of *Prunus serotina* in vitro cultures. *HortScience* 41(1):193-201.

PEER REVIEWED SYMPOSIA

Zambino, P.J., Pijut, P.M., Echt, C.S., and C.H. Michler. 1998. Dry-grinding miniprep method for extracting DNA from urediospores, aeciospores, and teliospores of white pine blister rust, *Cronartium ribicola*. *Proc. First IUFRO Rusts of Forest Trees, Saariselka, Finland, Finnish Forest Research Institute Research Papers* 712:297-299.

Davis, J., Blakeslee, G., Luce, S., LaRussa, L., Tignor, M., and C. Michler. 1998. An approach to identify slash pine genes associated with tolerance to pitch canker disease. *Proc. IMPACT Monterey, Asilomar, CA.*

Michler, C.H., Bosela, M.J., Pijut, P.M. and Woeste, K.E. 2003. The Hardwood Tree Improvement and Regeneration Center: Its strategic plans for sustaining the hardwood resource. Van Sambeek, J.W., Dawson, J.O., Ponder, F. Jr., Loewenstern, E.F., and Fralish, J.S. (eds). In: *Proc. 13th Central Hardwood Forest Conference, GTR NC-234, St. Paul, MN, pp. 460-465.*

Bosela, M.J., Smagh, G.S. and Michler, C.H. 2004. Genetic transformation of black walnut (*Juglans nigra*). Michler, C.H., Pijut, P.M., Van Sambeek, J., Coggeshall, M., Seifert, J., Woeste, K., and Overton, R. 2004. (eds.) *Black walnut in a new century. Proceedings of the 6th Walnut Council research symposium, 2004 July 25-28, Lafayette, IN. Gen. Tech. Rep. NC-243. St. Paul, MN : U.S. Department of Agriculture, Forest Service, North Central Research Station, pp. 45-58.*

Michler, C.H., Meilan, R., Woeste, K.E., Pijut, P.M., Jacobs, D., Aldrich, P. and Glaubitz, J.C. 2006. Hardwood genetics and tree improvement – a Midwest USA perspective. In: *Proc. of the Thin Green Line, Thunder Bay, Ontario, Canada, On. For. Res. Inf. Pap. No. 160, Pp. 69-74.*

POPULAR ARTICLES

- Michler, C. and T.A. Fretz. 1979. Ohio Short Course focuses on future. *American Nurseryman* 151:126-131.
- Lane, B.H., Michler, C., and C.H. Gilliam. 1980. Nurserymen discuss energy and management. *American Nurseryman* 152:60-65.
- Michler, C. and R.D. Lineberger. 1980. Establishment of a tissue culture facility. Ohio State University Press. pp. 1-4.
- Michler, C.H. and R.D. Lineberger. 1981. Ohio Landscapers examine conservation. *American Nurseryman* 153:11.
- Crooks, P., Lane, B., Michler, C., and S. Still. 1981. Ohio learns about selling. *American Nurseryman*. 153:124-129.
- Klahr, M., Loveless, J., Michler, C., and S. Still. 1983. Tips for buying nursery stock. *American Nurseryman* 153:49-54.
- Michler, C.H. 1999. Application of advanced technologies for improvement of hardwood forests. *Woodland Steward* 8(2):12-13.
- Michler, C.H. 2000. Geneticists are designing better hardwoods. *Hardwood Matters* 4:5-6.
- Michler, C.H. and K.E. Woeste. 2001. Research highlights from the Hardwood Tree Improvement and Regeneration Center. *Hardwood Matters* 14:10-11.
- Broussard, S.R., C. Lamprecht, and C. Michler. 2005. 2004 Indiana Logger Survey. 40 p. Purdue University.
- Michler, C., D. Jacobs, R. Meilan, P. Pijut, and K. Woeste. 2006. The Hardwood Tree Improvement and Regeneration Center looks to the future. *Hardwood Matters* (April) p. 6-7.

BOOKS

- Michler, C.H., Becwar, M.R., Cullen, D., Nance, W., Sederoff, R. and Slavicek, J. 1994. Proceedings of the Second International Symposium of the Applications of Biotechnology to Tree Culture, Protection and Utilization. Minneapolis, MN. General Technical Report NC-175.
- Michler, C.H. 1999. Consensus document on the biology of *Picea abies* (L.) Karst (Norway spruce). OCDE-OECD Series on Harmonization of Regulatory Oversight in Biotechnology No. 12. Paris, France: OECD Environmental Health and Safety Publications. 41 p .

Michler, C.H., Pijut, P.M., Van Sambeek, J., Coggeshall, M., Seifert, J., Woeste, K., and Overton, R. 2004. (eds.) Black walnut in a new century. Proceedings of the 6th Walnut Council research symposium, 2004 July 25-28, Lafayette, IN. Gen. Tech. Rep. NC-243. St. Paul, MN : U.S. Department of Agriculture, Forest Service, North Central Research Station. 188 p.

Weigel, D.R., Van Sambeek, J.W., and Michler, C.H. 2005 (eds.) Ninth workshop on seedling physiology and growth problems in oak plantings. Gen. Tech. Rep. NC-262. St. Paul, MN: US Department of Agriculture, Forest Service, North Central Research Station. 28 p.

BOOK CHAPTERS

Michler, C.H. and Bauer, E. 1988. Selection for herbicide tolerance in *Populus* to sulfometuron methyl in vitro. In: Genetic Manipulation of Woody Plants, Michigan State University, East Lansing. J.W. Hanover and D.E. Keathley (eds.), Vol.44a; 479-480. Plenum Press, NY.

Michler, C.H. and Haissig, B.E. 1988. Increased herbicide tolerance of in vitro selected hybrid poplar. In: Somatic Cell Genetics of Woody Plants. M.R. Ahuja (ed.), pp.183-189. Kluwer.

Michler, C.H. 1993. In vitro genetic selection for woody plant improvement. In: Ahuja, M.R., ed., pp.443-455, Micropropagation of Woody Plants, Kluwer Academic Pub., Dordrecht.

Ostry, M.E. and Michler, C.H.. 1993. Use of biotechnology for tree improvement in *Populus* model systems. In: Ahuja, M.R., ed., pp. 471-483, Micropropagation of Woody Plants, Kluwer Academic Pub., Dordrecht.

Michler, C.H. 1994. Somatic embryogenesis in *Populus* spp. In: Jain, M., ed., Somatic embryogenesis in Woody Plants, Vol. 2-Angiosperms, pp. 89-97. Kluwer Academic Pub., Dordrecht.

Michler, C.H., Woeste, K.E., and Pijut, P.M. 2007. Black walnut (*Juglans nigra* L.): Early molecular characterization of an economically important fine hardwood. Genome Series: Vol. 6: Forest trees, Fiber, Fodder and Forage and Plantation Crops. Oxford Publishing.

PRESENTATIONS (since 2004)

Michler, C., Meilan, R., Woeste, K., Pijut, P. Jacobs, D.F., Aldrich, P. and Glaubitz, J. Hardwood tree improvement-a North American perspective. British and Irish Hardwood Improvement Conference: Better trees, better profits. Stoneleigh, England, March, 4, 2004.

Smagh, G.S., Bosela, M.J., Michler, C.H., and Pijut, P.M. 2004. Kanamycin sensitivity and genetic transformation of black walnut somatic embryos. 6th Walnut Council research symposium, 2004 July 25-28, Lafayette, IN.

Michler, C., Woeste, K., Pijut, P., Jacobs, D.F., Meilan, R., and Ostry, M.E. 2004. Improving disease resistance of butternut (*Juglans cinera*), a threatened fine hardwood: a case for single tree selection through genetic improvement. North American Forest Biology Workshop, Houghton, MI.

Michler, C.H., Jacobs, D.F., Pijut, P.M., Meilan, R. and Woeste, K. 2004. Fine hardwood tree improvement: Enhanced productivity and species restoration. National Hardwood Lumber Association 107th Annual Convention, Toronto, CA, September 30, 2004.

Liang, X., Roschke, C., Pijut, P.M., Michler, C.H., and Meilan, R. 2005. Genetically engineering black walnut for tolerance to Arsenal. FNR Research Symposium, West Lafayette, IN.

Fan, Y., Woeste, K., Cassens, D., Michler, C., Szymanski, D., and Meilan, R. 2005. Genetic and phenotypic characterization of figured wood in poplar. FNR Research Symposium, West Lafayette, IN.

Smagh, G.S., Michler, C.H. and Pijut, P.M. 2005. Kanamycin sensitivity and genetic transformation of black walnut somatic embryos. FNR Research Symposium, West Lafayette, IN.

Espinosa, C., Pijut, P.M., and Michler, C.H. 2005. Adventitious shoot regeneration and rooting of *Prunus serotina* in vitro cultures. FNR Research Symposium, West Lafayette, IN.

Huang, Z., S. Harding, C.J. Tsai, C. Michler, K. Woeste, and R. Meilan. 2005. Genetic control of heartwood formation in black walnut. FNR Research Symposium, West Lafayette, IN. April 18, 2005.

Michler, C.H., K. Woeste, D. Jacobs, R. Meilan, and P. Pijut. 2005. Hardwood tree improvement: Increased productivity and species restoration. Washington, DC, Arbor Day Symposium, Dirksen Senate Office Building, April 29, 2005.

Michler, C.H., D. Jacobs, K. Woeste, P. Pijut, and R. Meilan. 2005. Strategies for genetic improvement and sustainable management of Eastern hardwoods. Huntsville, AL, Alabama A&M, May 6, 2005.

Michler, C.H., R. Meilan, K.E. Woeste, P.M. Pijut, D. Jacobs, P. Aldrich, and J. Glaubitz. Hardwood genetics and tree improvement – a Midwest USA perspective. The Thin Green Line. Thunder Bay, Ontario, Canada. July 27, 2005.

Fan, Y., D.L. Cassens, D.B. Szymanski, K.E. Woeste, C.H. Michler and R. Meilan. 2006. Phenotypic characterization of "Curly aspen", *Populus canescens*, Sigma Xi, Purdue University, Feb. 14, 2006.

Meilan, R., Ci, S., Du, N., Bauer, L., Miller, D., Pijut, P., and Michler, C. 2005. Development of resistant ash to facilitate the eradication of EAB. EAB Conference, Pittsburgh, PA, Sept. 26-30, 2006.

Michler, C., D. Jacobs, R. Meilan, P. Pijut, and K. Woeste. 2006. The Hardwood Tree Improvement and Regeneration Center looks to the future. Annual meeting of the National Hardwood Lumber Association, Toronto, Ontario, Canada.

Liang, X., Meilan, R., Pijut, P.M., and Michler, C.H. 2006. Genetically engineering black walnut for tolerance to Arsenal. FNR Research Symposium, April 7, 2006.

Huang, Z, S. Harding, C.-J. Tsai, C. Michler, K. Woeste, and R. Meilan. 2006. Genetic control of heartwood formation in Black walnut. FNR Research Symposium, April 7, 2006.

Fan, Y., D.L. Cassens, D.B. Szymanski, K.E. Woeste, C.H. Michler, and R. Meilan. 2006. Phenotypic characterization of "Curly aspen", *Populus canescens*. CONFOR 2006, Rouyn-Noranda (Quebec).

Michler, C.H. 2006. Global competition in the hardwood market and need for genetic improvement. SAF-Washington Chapter, March 22, 2006.

Michler, C.H. 2006. Biological and technological advances in hardwood production, University and Industry Consortium, October 12, 2006.

Michler, C.H. 2006. Biological advances in hardwood tree improvement: Keeping Indiana competitive in the global market, PCARET, West Lafayette, IN, October 31, 2006.

Sturtevant, B.R., Townsend, P.A., Quinn, V.S., Anderson, D., Kneeshaw, D., Cooke, B., Fortin, M-J., Woeste, W., Michler, C., James, P., Wolter, P., Kindon, C., and Robert, L. 2006. Designing pest-resistant forest landscapes: A multi-scale test of the importance of spatial pattern. CSREES NRI, Indianapolis, IN, November 14, 2006.

Huang, Z., Harding, S., Tsai, C.-J., Michler, C., Meilan, R. and Woeste, K. 2007. Identification and characterization of genes involved in heartwood formation in black walnut. Plant and Animal Genome, San Diego, CA. January, 2007.

Woeste, K., Nelson, D., Berrang, P., Buford, M., Johnson, R., St. Clair, B., Mahalovich, M.F., Groover, A., Michler, C., Riemenschneider, D., Koch, J., and Crane, B. 2007. Plant breeding in the USDA Forest Service.

Michler, C.H., Jacobs, D., Pijut, P.M., Ginzler, M, and Woeste, K.E. 2007. HTIRC: Keeping Indiana competitive in the USA and global market. Indiana Department of Natural Resources, Division of Forestry annual meeting. Pokagon, IN, February 6, 2007. Invited.

Williams, A., Sharma, G., Schweitzer, C., Michler, C., Aldrich, P. and Kantety, R. Use of Microsatellites to Assess Genetic Diversity and Population Structure of Red Oak Species in Northern Alabama. Proceedings of the International Union of Forest Research Organizations (IUFRO) Conference, Stevens Point, Wisconsin, September 24- 27, 2006.

Williams, A., Sharma, G., Michler, C., Aldrich, P. and Kantety, R. 2006. Assessment of population diversity of red oak species in the Cumberland Plateau using DNA marker profiling. Proceedings of the XIV International Plant and Animal Genome Conference, San Diego, California, January 14- 18, 2006.

Chivoiu, B., Shao, G., Michler, C., Pope, P. Zhuang, Q., and Crawford, M. 2007. Forest carbon modeling for the Midwest. FNR Research Symposium, April 13, 2007.

Fan, Y., Cassens, D.L., Szymanski, D.B., Woeste, K.E., Michler, C.H., and Meilan, R. 2007. Spiral growth and ray cell expansion are involved in the formation of heritable figure grain in *Populus canescans*. FNR Research Symposium, April 13, 2007.

Huang, Z., Harding, S., Tsai, C-J., Michler, C., Meilan, R, and Woeste, K. 2007. Identification and characterization of genes involved in heartwood formation in Black Walnut. FNR Research Symposium, April 13, 2007.

PATENTS

Michler, C.H. and Haissig, B.E. 1994. Patent No. 5,354,943. Methods of high frequency tissue regeneration, regeneration of herbicide-tolerant *Populus* plants therewith, and the herbicide-tolerant plants made thereby.

GRANTS RECEIVED

1987-2007 – Department of Energy, National Science Foundation, Fletcher Challenge, International Paper, IHLA, NHLA, Walnut Council, USDA Competitive Grants, IFWOA, USDA Forest Service, and Purdue University . (\$7,104,280)

ENDOWMENTS RECEIVED

2001 – Fred M. van Eck Foundation for Hardwood Tree Improvement and Regeneration Center. \$ 34,205,000.

STUDENTS COMPLETED

Carolina Espinosa, MS. 2004. Adventitious shoot regeneration of *Prunus serotina*.

Gurpreet Smagh, MS. 2005. Genetic transformation of *Juglans nigra*.

GRADUATE COMMITTEES

Erin Victory, MS. 2004. Population genetics of *Juglans nigra*.

Scott Rogers, MS. Genetic improvement of white oak..

Rosie Goodman, MS. Effects of nitrogen fertilization on intensively grown black walnut.

Youran Fan, Ph.D. Determination of the genetic mutations that cause spiral grain in *Juglans nigra*.

Julie Huang, Ph.D. Microarray analysis of heartwood formation in *Juglans nigra*.

Xiaomei Liu, Ph.D. Control of flowering in *Prunus serotina* in vitro cultures.

Ningxia Du, Ph.D. Improvement of ash for resistance to Emerald Ash Borer.