

Biography

Plant Physiology & Genetics Research Unit USDA-ARS, Arid-Land Agricultural Research Center



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Education:

Ph.D. Botany, University of California-Berkeley 1981

B.A. Biology, Harvard College 1975

Research Interests:

Has studied the physiology of crop adaptation to water deficits, photoperiod and temperature. Emphasis has been on field-level studies of whole plant growth and development and use of simulation models to guide hypothesis generation. For much of his professional career the research was largely tied to crop improvement and understanding the genetic basis of differences in adaptation, which also lead to explorations on use of integration of information from genomics with field-level physiology. Over the past ten years, emphasis has expanded to understanding crop response to management, especially tillage and residue management and to scaling up patterns of crop adaptation using geospatial techniques and integrated data management. Current research deals with predicting likely impacts of global change on crop production.

Key Publications

Publications from Research at the USALARC

1. White, J.W. 2006. From genome to wheat: emerging opportunities for modelling wheat growth and development. *Eur. J. Agron.* 25: 79-88.
2. Derner, J.D., G.E. Schuman, M.D. Jawson, S.R. Shafer, J.A. Morgan, H.W. Polley, G.B. Runion, S.A. Prior, H.A. Torbert III, H.H. Rogers, Jr., J.A. Bunce, L.H. Ziska, White, J.W., A.J. Franzluebbers, J. Reeder S., R.T. Venterea, and L.A. Harper. 2006. USDA-ARS Global Change Research on Rangelands and Pasturelands. *Rangelands* 27(5): 36-42.
3. White, J.W., G. Hoogenboom, and L.A. Hunt. 2005. A structured procedure

- for assessing how crop models respond to temperature. *Agron. J.* 97:426-439.
4. Edmeades, G.O., G.S. McMaster, J.W. White, and H. Campos. 2004. Genomics and the physiologist bridging the gap between genes and crop response. *Field Crops Res.* 90:5-18.
 5. Hoogenboom, G., J.W. White, and C.D. Messina. 2004. From genome to crop integration through simulation modeling. *Field Crops Res.* 90:145-163.
 6. White, J.W., McMaster, G.S. and Edmeades, G.O. 2004. Preface: Physiology, Genomics and Crop Response to Global Change. *Field Crops Res.* 90:1-3.
 7. White, J.W., McMaster, G.S. and Edmeades, G.O. 2004. Genomics and Crop Response to Global Change: What Have We Learned? *Field Crops Res.* 90:165-169. .
 8. White, J.W., and G. Hoogenboom. 2005. Integrated viewing and analysis of phenotypic, genotypic, and environmental data with "GenPhEn Arrays". *European J. Agron.* 23:170-182.
 9. White, J.W., and C. Montes. 2005. Variation in parameters related to leaf thickness in common bean (*Phaseolus vulgaris* L.). *Field Crops Res.* 91:7-22

Research on GIS and crop modeling conducted at CIMMYT (1995-2002)

10. Elings, A., J.W. White, and G. Edmeades. 1997. Options for breeding for greater maize yields in the tropics. . *European Journal of Agronomy* 7:119-132.
11. Harrington, L. W., J. W. White, P. Grace, D. P. Hodson, A. D. Hartkamp, C. Vaughan, and C. Meisner. Delivering the Goods: Scaling out Results of Natural Resource Management Research. *Conservation Ecology* 5[2], 19. 2002.
12. Hartkamp, A.D., G. Hoogenboom, and J.W. White. 2002. Adaptation of the CROPGRO growth model to Velvet Bean as a green manure cover crop: I. Model development. *Field Crops Research* 78:9-25.
13. Hartkamp, A.D., G. Hoogenboom, J.W. White, R. Gilbert, T. Benson, H.J. Barreto, A. Gijssman, S. Tarawali, and W. Bowen. 2002. Adaptation of the CROPGRO growth model to velvet bean as a green manure cover crop: II. Model testing and evaluation. *Field Crops Research* 78:27-40.
14. Hartkamp, A.D., J.W. White, and G. Hoogenboom. 2003. Comparison of Three Weather Generators for Crop Modeling: a Case Study for Subtropical Environments. *Agricultural Systems* 76:539-560.
15. Hartkamp, A. D., J. W. White, and G. Hoogenboom. Interfacing Geographic Information Systems with agronomic modeling: A review. *Agronomy Journal* 91, 761-772. 1999.

16. Hartkamp, A. D., J. W. White, A. Rodriguez-Aguilar, M. Banziger, G. Srinivasan, G. Granados, and J. Crossa. *Maize Production Environments Revisited: A GIS-based Approach*. 2000. Mexico City, CIMMYT.
17. Hartkamp, A.D., J.W. White, W.A.H. Rossing, M.K. van Ittersum, E.J. Bakker, and R. Rabbinge. 2004. Regional application of cropping systems simulation model: crop residue retention in maize production systems of Jalisco, Mexico. *Agricultural Systems* (in press).
18. Hoogenboom, G., and J.W. White. 2003. Improving physiological assumptions of simulation models by using gene-based approaches. *Agronomy Journal* 95:82-89.
19. Longhorn, R. A. V. Henson-Apollonio and J. W. White J. W. 2002. *Legal Issues in the Use of Geospatial Data and Tools for Agriculture and Natural Resource Management: A Primer*. Mexico City: CIMMYT, Int.
20. White, J. W., D. G. Tanner, and J. D. Corbett. An agroclimatological characterization of bread wheat production areas in Ethiopia. 2001. Mexico, D.F., Mexico, CIMMYT. NRG-GIS Series.
21. White, J. W., M. van Ginkel, S. Rajaram, and J. D. Corbett. 2001. A GIS-based Approach to Revising CIMMYT's Wheat Megaenvironment Classification. Paper presented at Annual Meetings of the ASA.

Research on physiology of common bean, conducted at CIAT (1983-1995)

22. Acosta-Gallegos, J.A., and J.W. White. 1995. Phenological plasticity as an adaptation by common bean to rainfed environments. *Crop Science* 35:199-204.
23. Ehleringer, J.R., J.W. White, D.A. Johnson, and M. Brick. 1990. Carbon isotope discrimination, photosynthetic gas exchange, and transpiration efficiency in beans and range grasses. *Acta Oecologia* 11:611-625.
24. Hoogenboom, G., and J.W. White. 1996. Predicting weather and management effects on dry bean yield. *Annual Report of the Bean Improvement Cooperative* 39:71-72.
25. Hoogenboom, G., J.W. White, J. Acosta-Gallegos, R. Gaudiel, J.R. Myers, and M.J. Silbernagel. 1997. Evaluation of a crop simulation model that incorporates gene action. *Agronomy Journal* 89:613-620.
26. Hoogenboom, G., J.W. White, J.W. Jones, and K.J. Boote. 1994. BEANGRO: A process-oriented dry bean model with a versatile user interface. *Agronomy Journal* 86:182-190.
27. Hunt, L.A., M.P. Reynolds, K.D. Sayre, S. Rajaram, J.W. White, and W. Yan. 2003. Crop modeling and the identification of groups of genes of significance in crop production. *Agronomy Journal* 95:20-31.
28. Hunt, L.A., J.W. White, and G. Hoogenboom. 2001. Agronomic data:

- advances in documentation and protocols for exchange and use. *Agricultural Systems* 70: 477-492.
29. Jaramillo, G., J.W. White, and G. De la Cruz A. 1992. The effect of soil compaction on differentiation of late metaxylem in common bean (*Phaseolus vulgaris* L.). *Annals of Botany* 70.
 30. Kornegay, J., J.W. White, J.R. Dominguez, G. Tejada, and C. Cajiao. 1993. Inheritance of photoperiod response in Andean and Mesoamerican common bean. *Crop Sci.* 33:977-984.
 31. Lynch, J., and J.W. White. 1992. Shoot nitrogen dynamics in tropical common bean. *Crop Sci.* 32:392-397.
 32. Mace, E. S., P. N. Fox, J. W. White, I. H DeLacy, and C. G. McLaren. 2001. The ICIS solution for the integration of diverse data for the efficient management of solanaceous germplasm. In *Solanacea V: Advances in Taxonomy and Utilization*, edited by R.G. van den Berg, G. W. M. Barendse G. M. van der Weerden C. Mariani (Nijmegen, The Netherlands: Nijmegen University Press).
 33. Montes-R., C., and J.W. White. 1996. Effect of selection for pollen grain size on various traits in common bean. *Euphytica* 90:59-63.
 34. Sadik, S., and J.W. White. 1982. True potato seed drying over rice. *Potato Res.* 25:269-272.
 35. Sexton, P.J., C. Peterson, K.J. Boote, and J.W. White. 1994. Early-season growth in relation to region of domestication, seed size, and leaf traits in common bean. *Field Crops Res.* 52:69-78.
 36. Sponchiado, B.N., J.W. White, J.A. Castillo, and P.G. Jones. 1989. Root growth of four common bean cultivars in relation to drought tolerance in environments with contrasting soil types. *Exp. Agric.* 25:249-257.
 37. White, J.W. 2001. An agroclimatological characterization of the Indo-Gangetic Plains. *J. Crop Production* 3:53-65.
 38. White, J. W. 1993. Implications of carbon isotope discrimination studies for breeding common bean under water deficits. In *Stable isotopes and plant carbon water relations*, edited by Ehleringer, J., A. E. Hall, and G. D. Farquhar (New York: Academic Press).
 39. White, J.W., and J.A. Castillo. 1992. Evaluation of diverse shoot genotypes on selected root genotypes of common bean under soil water deficits. *Crop Science* 32:762-765.
 40. White, J.W., and J.A. Castillo. 1989. Relative effect of root and shoot genotypes on yield of common bean under drought stress. *Crop Sci.* 29:360-362. *Crop Science* 29:360-362.
 41. White, J.W., J.A. Castillo, and J. Ehleringer. 1990. Associations between productivity, root growth and carbon isotope discrimination in *Phaseolus vulgaris* under water deficit. *Aust. J. Plant Physiol.* 17:189-198.
 42. White, J. W., J. A. Castillo, J. R. Ehleringer, J. A. Garcia-C., and S. P. Singh. 1994. *Relations of carbon isotope discrimination and other physiological traits to yield in the common bean (Phaseolus vulgaris) under rainfed*

conditions. In press.

43. White, J.W., J.D. Corbett, and A. Dobermann. 2002. Insufficient Use of Meso-Resolution Spatial Analysis in the Planning, Execution and Dissemination of Agronomic Research? *Field Crops Research* 76: 45-54.
44. White, J.W., and A. Gonzalez. 1990. Characterization of the negative association between seed yield and seed size among genotypes of common bean. *Field Crops Research* 23: 159-175.
45. White, J.W., and G. Hoogenboom. 2003. Gene-based approaches to crop simulation: past experiences and future opportunities. *Agronomy Journal* 95: 52-64.
46. White, J.W., and G. Hoogenboom. (in review). Integrated viewing and analysis of phenotypic, genotypic, and environmental data with "GenPhEn Arrays". *Crop Sci.*
47. White, J.W., and G. Hoogenboom. 1996. Simulating effects of genes for physiological traits in a process-oriented crop model. *AGronomy Journal* 88: 416-422.
48. White, J.W., G. Hoogenboom, and L.A. Hunt. (in review). A structured procedure for assessing how crop models respond to temperature. *Agronomy Journal*.
49. White, J.W., G. Hoogenboom, J.W. Jones, and K.J. Boote. 1995. Evaluation of the dry bean model Beangro V1.01 for crop production research in a tropical environment. *Experimental Agriculture* 31: 241-254.
50. White, J.W., J. Kornegay, and C. Cajiao. 1996. Inheritance of temperature sensitivity of the photoperiod response in common bean (*Phaseolus vulgaris*). *Euphytica* 91: 5-8.
51. White, J.W., J. Kornegay, J. Castillo, C.H. Molano, C. Cajiao, and G. Tejada. 1992. Effect of growth habit on yield of large-seeded bush cultivars of common bean. *Field Crops Research* 29: 151-161.
52. White, J.W., and D.R. Laing. 1989. Photoperiod response of flowering in diverse genotypes of common bean (*Phaseolus vulgaris*). *Field Crops Research* 22: 113-128.
53. White, J.W., and C.H. Molano. 1994. Production of common bean under saturated soil culture. *Field Crops Research* 36: 53-58.
54. White, J.W., and C. Montes. 1993. The influence of temperature on seed germination in cultivars of common bean. *Journal of Experimental Botany* 44: 1795-1800.
55. White, J.W., and C. Montes. (in review). Variation in parameters related to leaf thickness in common bean (*Phaseolus vulgaris* L.). *Field Crops Res.*
56. White, J.W., C. Montes, and Y.L. Mendoza. 1992. Use of grafting to characterize and alleviate hybrid dwarfness in common bean. *Euphytica* 59: 19-25.
57. White, J. W., F. A. J. F. Neuman, P. K. Aggarwal, and S. P. Kam. 2000. Modern tools to service better natural resources planning and for developing contingency plans for monsoon aberrations, and for yield forecasting. Paper

presented at Developing an Action Program for Farm-level Impact in Rice-Wheat Systems of the Indo-Gangetic Plains," 25-27 Sept., 2000; New Dehi. Ministry of Agriculture, Government of India.

58. White, J.W., R. Ochoa-M., F. Ibarra-P., and S.P. Singh. 1994. Inheritance of seed yield, maturity and seed weight of the common bean (*Phaseolus vulgaris*) under semiarid rainfed conditions. *J. Agric. Sci. (Camb.)* 122:265-273.
59. White, J.W., and S. Sadik. 1983. Potatoes from true seed: a promising alternative? *Span* 26:1325.
60. White, J.W., and S.P. Singh. 1991. Sources and inheritance of earliness in tropically adapted indeterminate common bean. *Euphytica* 55:15-19.
61. White, J.W., S.P. Singh, C. Pino, M.J. Rios B., and I. Buddenhagen. 1992. Effects of seed size and photoperiod response on crop growth and yield of common bean. *Field Crops Research* 28:295-307.