

Abbreviated Curriculum Vitae - Ian M. Ray

Education:

Ph.D. 1989 Plant Breeding and Plant Genetics, University of Wisconsin-Madison.
M.S. 1987 Plant Breeding and Plant Genetics, University of Wisconsin-Madison.
B.S. 1985 Agriculture (Chemistry minor), New Mexico State University-Las Cruces.

Research Positions and Employment:

1989-1993 Research Geneticist, USDA-ARS, Northern Great Plains Res. Lab, Mandan, ND.
1994-2000 Assistant Professor, Dept. of Agronomy & Horticulture, New Mexico State Univ.
2000-2006 Associate Professor, Dept. of Agronomy & Horticulture, New Mexico State Univ.
2006-present Professor, Dept. of Plant & Environmental Sciences, New Mexico State Univ.

Current Research Emphasis: Genetic characterization and improvement of drought tolerance in alfalfa through molecular techniques and conventional breeding approaches.

Current* and Previously Taught Courses (1994-2018):

AGRO 610*	Advanced Plant Breeding	AGRO 365/365L	Principles Crop Production
GENE 315*	Molecular Genetics	AGRO 483	Sustainable Crop Production
GENE 440*	Genetics Seminar	AGRO/BIOL 486	Intermediate Genetics
GENE 486*	Genes and Genomes	GENE 305L	Genetic Tech. Laboratory

Graduate Student Advising (past 5 years):

Harpreet Kaur and Arshdeep Singh Gill: current Ph.D. and M.S. candidates, respectively.
Lovepreet Singh, M.S. degree completed 2017; Gina Babb, Ph.D. degree completed 2014; Nick Santantonio and Chris Pierce, M.S. degrees completed 2013.

Honors and Awards (past 5 years):

2013-present Billy and Louis Melton Endowed Chair in Plant Breeding and Genetics (NMSU)
2015 Donald C. Roush Excellence in Teaching Award (NMSU)
2013 College of ACES Teaching Excellence Award (NMSU)

Funded Projects (past 5 years):

Ray, IM (PI) and L. Yu. (2016-2021) Marker Assisted Breeding in Elite Alfalfa Germplasm to Enhance Biomass Productivity during Drought. Amount: \$381,108. Source: Alforex Seeds.
Putnam, D. (PI) and I.M. Ray. (2014-2017) Subsurface Drip Irrigation, Deficit Irrigation Strategies, and Improved Varieties to Improve Alfalfa Water Use Efficiency under Drought Conditions. Amount: \$108,868. Source: USDA-NIFA.
Ray, I.M. (PI). (2012-2015) DNA Marker Assisted Selection to Improve Alfalfa Production in Drought-Prone Environments. Amount: \$50,000. Source: Cal-West Seeds.

Selected Peer-Reviewed Publications From Among 54 Articles: (Graduate students underlined)

Santantonio, N., C.A. Pierce, R.L. Steiner, and **I.M. Ray**. 2018. Genetic mapping of water-use efficiency and carbon and nitrogen metabolism in drought-stressed alfalfa. *Crop Sci.* In press.
Ray, I.M., M.J. Monteros, B. Julier, M.K. Sledge, and E.C. Brummer. 2018. Identification of consensus regions associated with shoot biomass production in the *Medicago* genome. *Crop Sci.* 58: 1037-1060.
Wang, J., Y. Zhao, **I. Ray**, M. Song. 2016. Transcriptome responses in alfalfa associated with tolerance to intensive animal grazing. *Nature-Scientific Reports*. doi:10.1038/srep19438

- Ray, I.M.,** Y. Han, L. E. C.D. Meenach, N. Santantonio, M.K. Sledge, C.A. Pierce, T.M. Sterling, R.K. Kersey, et al. 2015. Identification of quantitative trait loci for alfalfa forage biomass productivity during drought stress. *Crop Sci.* 55:2012-2033.
- Ray, I.M.** C.A. Pierce, and C.G. Currier. 2012. Registration of 'NuMex Bill Melton' alfalfa for variable soil moisture environments. *J. Plant Registrations.* 6:137-140.
- Bhandari, H.S., A.H. Al Lawati, and **I.M. Ray**. 2011. AFLP marker diversity among high yielding perennial alfalfa core collection accessions. *Crop Sci.* 51: 1110-1121.
- Al Lawati, A., C.A. Pierce, L.W. Murray, and **I.M. Ray**. 2010. Combining ability and heterosis for forage yield among elite alfalfa core collection accessions possessing different fall dormancy responses. *Crop Sci.* 50:150-158.
- Fiore, C. J. Schroeder, S. Thomas, L. Murray, and **I. Ray**. 2009. Root-knot nematode-resistant alfalfa suppresses subsequent chile crop damage from the nutsedge-nematode pest complex. *Agron. J.* 101:754-763.
- Madril, C.M., C.A. Pierce and **I.M. Ray**. 2008. Heterosis among hybrids derived from genetically improved and unimproved alfalfa germplasm. *Crop Sci.* 48: 787-1792.
- Bhandari, H.S., C.A. Pierce, L.W. Murray, and **I.M. Ray**. 2007. Combining abilities and heterosis for forage yield among high-yielding accessions of the alfalfa core collection. *Crop Sci.* 47:665-673.
- Sledge, M.K., **I.M. Ray**, and G. Jiang. 2005. An expressed sequence tag SSR map of tetraploid alfalfa (*Medicago sativa* L.). *Theor. Appl. Genet.* 111:980-992.
- Segovia-Lerma, A., L.W. Murray, M.S. Townsend, and **I.M. Ray**. 2004. Population-based diallel analyses among nine historically recognized alfalfa germplasms. *Theor. Appl. Genet.* 109:1568-1575.
- Ray, I.M., A. Segovia-Lerma, and L.W. Murray. 2004. Diallel analysis of carbon isotope discrimination and its association with forage yield among nine historically recognized alfalfa germplasms. *Crop Sci.* 44:1970-1975.**
- Segovia-Lerma, A., R.G. Cantrell, and **I.M. Ray**. 2003. AFLP-based assessment of genetic diversity among nine alfalfa germplasms using bulk DNA templates. *Genome* 46:51-58.
- Murray, L.W., **I.M. Ray**, H. Dong, and A. Segovia-Lerma. 2003. Clarification and re-evaluation of population-based diallel analyses: Gardner and Eberhart analyses II and III revisited. *Crop Sci.* 43:1930-1937.
- Ray, I.M., M.S. Townsend**, J.A. Henning. C.G. Currier, and B.A. Melton. 2000. Registration of NM-9D11A-AN3 anthracnose resistant alfalfa germplasm with increased yield potential for water-limited environments. *Crop Sci.* 40:864.
- Ray, I.M., M.S. Townsend**, J.A. Henning. C.G. Currier, and B.A. Melton. 1999. Registration of NM-9D11A-PRR3 phytophthora resistant alfalfa germplasm with increased yield potential for irrigated and water-limited environments. *Crop Sci.* 39:1537-1538.
- Ray, I.M., M.S. Townsend**, and J.A. Henning. 1999. Heritabilities of water-use efficiency traits and correlations with agronomic traits in water-stressed alfalfa. *Crop Sci.* 39:494-498.
- Ray, I.M., M.S. Townsend**, and J.A. Henning. 1998. Variation for yield, water-use efficiency, and canopy morphology among nine alfalfa germplasms. *Crop Sci.* 38:1386-1390.

New Mexico Alfalfa Variety Test Reports (2013-2017):

Lauriault, L. M., **Ray, I.**, Pierce, C., Burney, O., Flynn, R. P., Marsalis, M. A., O'Neill, M. K. (2013-2017). *The New Mexico Alfalfa Variety Test Report*. Las Cruces, NM: Agricultural Experiment Station and Cooperative Extension Service, New Mexico State University.
http://aces.nmsu.edu/pubs/variety_trials/AVT17.pdf http://aces.nmsu.edu/pubs/variety_trials/AVT16.pdf
http://aces.nmsu.edu/pubs/variety_trials/AVT15.pdf http://aces.nmsu.edu/pubs/variety_trials/AVT14.pdf
http://aces.nmsu.edu/pubs/variety_trials/2013AlfalfaVarietyReport.pdf