

University of Guelph NCR-167 Station Report - 2002

Location: Guelph and Ridgetown, Ontario, Canada

Personnel: Elizabeth Lee (faculty), Byron Good (field technician), Mary Jane Ash (field technician), Scott Jay (field technician), Chris Grainger (lab technician), Jennifer Young (M.Sc. student), Ardeshir Ahmadzadeh (Ph.D. student), Trevor Doerksen (M.Sc. student), Kris McNaughton (M.Sc. student).

Breeding focus:

- Short-season yellow dent inbred lines
- White and yellow food grade inbred lines
- Germplasm enhancement

Research areas:

- Late-season cold tolerance
- Genetics underlying kernel quality in food corn
- Genetics of grain yield and of the physiological processes contributing to grain yield
- Yield potential and general stress tolerance

Inbred line releases:

CGR01 - derivation: ((B93 x NK2555) x NK2555)-B-2-7-1-1

CGR02 - derivation: (CG44x(MF4xP1247)-3)-B-2-1-1-1

CGR03 - derivation: ((B100 x NK2555) x NK2555)-B-1-5-1-1

CGR04 - derivation: (B93 x NK2555)-B-3-2-1-1

CGR05 - derivation: (Cargill5677 x CG103)-B-1-4-1-1

CGR06 - derivation: ((Cargill5677xCG EliteB C4S3)xCargill5677)-B-2-4-1-1

CG110 - derivation: (CCGP A C2 x NK2555)

CG111 - derivation: (CCGP B C2 x NK2555)

CG112 - derivation: (CG SynA x Pioneer3475)

CG113 - derivation: (CG SynA x Pioneer3475)

CG114 - derivation: (CG102 x G-4193)

CG115(W) - derivation: (CG CBI C3 x Pioneer3876)

Theses:

Trevor Doerksen, January 8, 2002, Impact of recurrent selection on GCA and SCA. (M.Sc.).

Kris McNaughton, January 10, 2002, Mutations in the ALS Gene Conferring Herbicide Resistance in Redroot Pigweed (*Amaranthus retroflexus*) and Green Pigweed (*A. powellii*). (M.Sc.). Co-advised by F. Tardiff

Publications:

Darrah, L.L. L.D. Maddux, B.E. Hibbard, D.B. Wilmont, E.A. Lee, W. Xu, D.R. West, J. McKinney, F.J. Betran, J.K. Pataky, P.M. Michener, K.E. Ziegler, B. Gordon, R.W. Elmore, P.R. Thomison, A.B. Geyer, R.J. Minyo, D.E. Stenburg, W.L. Pearce, A. Schaafsma, Zeno Wicks III P. Friedemann, R. Henry, D.B. Fischer, J.F. Strissel, J.A.

- Deutsch, and S. Tragessor. 2002. White Food Corn 2002 Performance Tests. Special Report 547. USDA-ARS and Agricultural Experiment Station, University of Missouri-Columbia.
- McMullen, M.D., E.A. Lee, S.J. Szalma, B.S. Bushman, and M.E. Snook. 2002. The role of quantitative trait locus analysis in gene discovery. Proc. of the 56th Annual Corn and Sorghum Research Conference. 56:237-245.
- Diebold, R.S., K.E. McNaughton, E.A. Lee and F.J. Tardif. 2002. Multiple resistance to imazethapyr and atrazine in Powell amaranth. Weed Sci. (accepted Aug. 2002)
- Tollenaar, M., and E.A. Lee. 2002. Yield potential yield, yield stability and stress tolerance in maize. Field Crops Research. 75:161-170.
- Ying, J., E.A. Lee and M. Tollenaar. 2002. Response of leaf photosynthesis during the grain-filling period of maize to duration of cold exposure, acclimation and incident PPFD. Crop Sci. 42:1164-1172.
- Lee, E.A., M.S. Staebler, and M. Tollenaar. 2002. Genetic variation and physiological discriminators for cold tolerance in maize (*Zea mays* L.) during an early autotrophic phase of development. Crop Sci. 42:1919-29.
- Doersken, T.K., L.W. Kannenberg, and E.A. Lee. 2002. The Impact of Recurrent Selection on Combining Ability in Maize (*Zea mays* L.) Breeding Populations. Crop Sci. (accepted July 2002).
- Lee, E.A. and V. Harper. 2002. *Suppressor of pericarp pigmentation 1 (spp1)*, a gene involved in phlobaphene accumulation in maize (*Zea mays* L.) pericarps. Maydica. 47:51-58.
- Tollenaar, M., and E.A. Lee. 2002. Genetic yield improvement and stress tolerance in maize. In: *Physiology and Biotechnology Integration for Plant Breeding*, H. Nguyen and A. Blum, eds. Marcel Dekker Inc., New York.

Posters and talks:

- Young, J, and E.A. Lee. 2002. QTLs affecting white food-grade corn quality. ASA-CSSA-SSSA annual meetings, Indianapolis, IN, November 10-14, 2002. (poster)
- Lee, E.A., T. K. Doerksen, and L.W. Kannenberg. 2002. Diallel analysis of yield stability in twelve maize breeding populations. ASA-CSSA-SSSA annual meetings, Indianapolis, IN, November 10-14, 2002. (talk)
- Weir, A.D., E.A. Lee and I. Rajcan. 2002. Molecular markers associated with seed protein and fatty acid content in an interspecific soybean population. Soy2002 meeting, Champaign-Urbana, IL, Aug. 11-14, 2002. (talk)
- Lee, E.A. 2002. Molecular markers for grain quality in white corn. White Food Corn Field Day, Topeka, KS, Sept. 6, 2002. (invited talk)