

# ASA, CSSA, and SSSA Virtual Issue Call for Papers: Advancing Resilient Agricultural Systems: Adapting to and Mitigating Climate Change

Content will focus on resilience to climate change in agricultural systems, exploring the latest research investigating strategies to adapt to and mitigate climate change. Innovation and imagination backed by good science, as well as diverse voices and perspectives are encouraged. Where are we now and how can we address those challenges? Abstracts must reflect original research, reviews and analyses, datasets, or issues and perspectives related to objectives in the topics below. Authors are expected to review papers in their subject area that are submitted to this virtual issue.

## Topic Areas

- Emissions and Sequestration
  - » Strategies for reducing greenhouse gas emissions, sequestering carbon
- Water Management
  - » Evaporation, transpiration, and surface energy balance
- Cropping Systems Modeling
  - » Prediction of climate change impacts
  - » Physiological changes
- Soil Sustainability
  - » Threats to soil sustainability (salinization, contamination, degradation, etc.)
  - » Strategies for preventing erosion
- Strategies for Water and Nutrient Management
  - » Improved cropping systems
- Plant and Animal Stress
  - » Protecting germplasm and crop wild relatives
  - » Breeding for climate adaptations
  - » Increasing resilience
- Waste Management
  - » Reducing or repurposing waste
- Other
  - » Agroforestry
  - » Perennial crops
  - » Specialty crops
  - » Wetlands and forest soils



## Deadlines

Abstract/Proposal Deadline: Ongoing  
Submission deadline: 31 Dec. 2022

## How to submit

Submit your proposal to  
[manuscripts@sciencesocieties.org](mailto:manuscripts@sciencesocieties.org)

Please contact Jerry Hatfield at  
[jerryhatfield67@gmail.com](mailto:jerryhatfield67@gmail.com) with any questions.



### Registration of 'Millhouse' Barley

'Millhouse' (Reg. No. CV-328, PI 642855; Canadian Reg. No. 6137) is a two-rowed hulless spring food barley (*Hordeum vulgare* L.) cultivar developed at the Agriculture and Agri-Food Canada (AAFC) Research Centre, Brandon, MB, Canada, which was registered on 19 May 2006 by the Variety Registration Office of the Canadian Food Inspection Agency, Ottawa, ON, Canada. Millhouse was tested at Brandon and in the Western Cooperative Hulless Barley Registration Test (2000 and 2001) under the experimental number HB 109. Millhouse was selected from the cross 'CDC Silky'/Brandon CC 080/BT 356/3/'Nordic'. Brandon CC 080 is a Composite-Cross two-rowed line derived from five cycles of male-sterile derived recurrent selection; BT 356 is a six-rowed malting line developed at the Brandon Research Centre and is a cross between 'Argyle' (PI496255; Canadian Food Inspection Agency, 1981) and 'Duel' (PI 539917; Canadian Food Inspection Agency, 1990). CDC Silky is a six-rowed hulless feed cultivar developed by the Crop Development Centre, University of Saskatchewan, Saskatoon, SK, Canada (Canadian Food Inspection Agency, 1994). Nordic is a six-rowed feed cultivar developed by North Dakota State University, Fargo, ND (Peterson et al., 1973).

The hybrid population (Brandon cross H133) from which Millhouse was derived was developed at the AAFC Research Centre, Brandon, MB, Canada, in 1994. Eighty F<sub>1</sub> seed were sown in the greenhouse and harvested in bulk. The F<sub>2</sub> population was sown in the field as a 3-m row and bulk harvested. The procedure was repeated for the F<sub>3</sub> generation using two rows 3 m long. Three hundred spikes were chosen at random from the F<sub>3</sub> bulk sample and grown as F<sub>4</sub> progeny rows. Individual progeny rows were selected from the F<sub>4</sub> population on the basis of visual assessment for large uniform spikes and good lodging resistance, as well as assessment of harvested grain for light kernel color, large size, and plumpness. F<sub>4</sub> selections were grown as 3- × 1-m F<sub>5</sub> plots in a nearest-neighbor design with 'CDC Candle' (Canadian Food Inspection Agency, 1994) and 'CDC Freedom' (Canadian Food Inspection Agency, 1998) as alternating check cultivars repeated every 20 plots. A single plot (H133-6) was selected from this F<sub>5</sub> population on the basis of kernel quality parameters, including light kernel color, bulk density, very low to nil hull retention, and high protein concentration, as well as superior agronomic performance (grain yield, straw strength) relative to CDC Candle. H133-6 was tested in a replicated field trial at Brandon in 1997. H133-6 was then tested at two locations in 1998 (Brandon, MB, and Hamiota, MB) and five locations in 1999 (Brandon, Hamiota, MB; Saskatoon, SK; and Neapolis and Olds, AB). In 2000, H133-6 was evaluated for food quality parameters at the Cereal Research Centre, Winnipeg, MB, under the direction of Dr. Nancy Ames, Cereal Chemist. Parameters included beta-glucan content, starch content and type, percent (by weight) crude protein, and flour yield. H133-6 was advanced on the basis of a unique profile suitable for blending with wheat (*Triticum aestivum* L.) flour in production of noodles. H133-6 was placed in the Western Cooperative Hulless Barley Registration Test (HBCoop) in 2000 as a unique food barley (suitable for milling as a flour additive). Larger scale laboratory and small scale pilot plant testing was conducted in 2001 to 2003 to confirm noodle production capabilities of H133-6.

Over 2 yr of evaluation in the HBCoop, Millhouse had 7% higher grain yield than CDC Candle, the food check cultivar in western Canada. Millhouse has significant improvements in flour quality vs. CDC Candle. Millhouse has higher flour yield than CDC Candle (87 vs. 70%), a lighter colored and thinner

bran than CDC Candle, low percent hull retention and moderate beta-glucan levels (4.5%), and viscosity (40.9 cP). In a 50% flour blend with No. 1 Canada Western Hard White Spring Wheat (CWHS) wheat, Millhouse produced superior quality white asian noodles (WAN) in comparison to CDC Candle and equal in quality to noodles made from 100% (CWHS) wheat flour. In comparison to CDC Candle, Millhouse is 2 d later maturing, lower in test weight, similar in plant height, slightly improved in lodging resistance, and has higher 1000-kernel weight and percent plump kernels.

The spike of Millhouse is long (8.0–12.2 cm, excluding the awns) and seminodding. Kernels are long and wide with white aleurone. Kernel (food) quality is unique, being the first of its type developed in Canada. Lemma awns are rough and lemma awn tips are white.

Millhouse is susceptible to *Fusarium* head blight, incited by *Fusarium graminearum* Schwabe [teleomorph *Gibberella zea* (Schwein)] but exhibits low levels of deoxynivalenol (DON) accumulation; is moderately susceptible to common root rot and spot blotch, both incited by *Cochliobolus sativus* [(Ito and Kuribayashi) Dreschs. ex Dastur.]; moderately susceptible to net blotch, incited by *Pyrenophora teres* Dreschs.; is susceptible in reaction to scald, incited by *Rhynchosporium secalis* (Oudem) J.J. Davis, and Septoria, incited by *Septoria passerinii* Sacc.. In addition, Millhouse is resistant to wheat stem rust, incited by *Puccinia graminis* Pers.:Pers. = *P. graminis* Pers.:Pers. f. sp. *tritici* Eriks. & E. Henn., except race QCCJ, and is intermediate in reaction to the spike smuts in barley, incited by *Ustilago* spp.

Seed from 300 uniform progeny rows at the F<sub>10</sub> generation were bulked to constitute the Breeder seed of Millhouse. Breeder seed is being maintained by AAFC at the Indian Head Research Farm, Indian Head, SK, Canada. The Canadian distributor for Millhouse is FarmPure Inc., 422 McDonald St. Regina, SK, Canada, S4N 6E1. Millhouse was granted Plant Breeders' Rights on 11 Aug. 2006 from the Plant Breeders' Rights Office of the Canadian Food Inspection Agency. Contact the Head of the Seed Increase Unit, AAFC Indian Head Research Farm, Indian Head, SK, Canada, for all seed requests. No seed will be distributed without written permission for 18 yr from the granting of Plant Breeders Rights (expires 11 Aug. 2024) by AAFC, at which time the seed will also be available from the National Plant Germplasm System (NPGS).

M.C. THERRIEN\* AND N.A. AMES

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M.C. Therrien, Agriculture and Agri-Food Canada, Brandon Research Centre, Box 1000A, R.R. #3, Brandon, MB, Canada, R7A 5Y3; N.A. Ames, Agriculture and Agri-Food Canada, Cereal Re-

search Centre, Winnipeg, MB, Canada R3T 2M9. Registration by CSSA. Received 10 July 2006. \*Corresponding author (mtherrien@agr.gc.ca).

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