# Reniform Resistance from *G. barbadense* 'TX110'

J. L. Starr, C. Wayne Smith, E. Zhou,
K. Ripple, E. Morgan

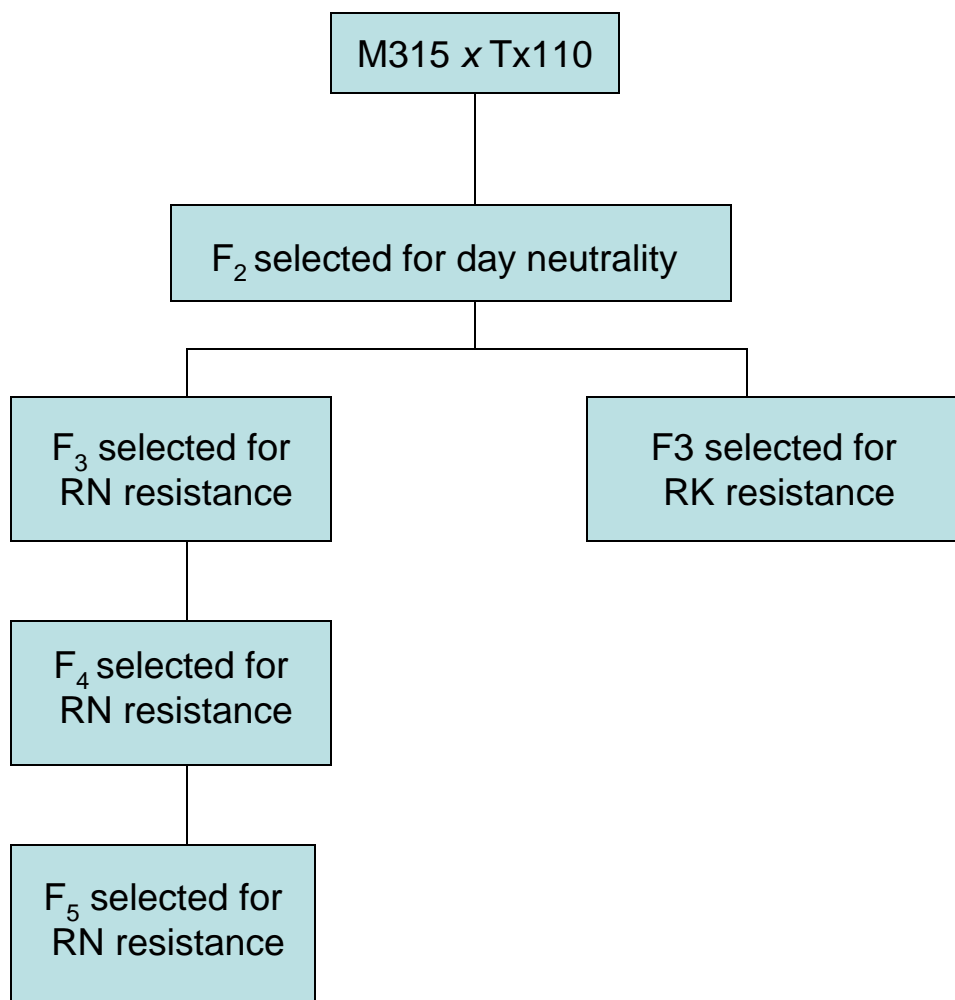Texas Agricultural Experiment Station

Primary Objectives

- Develop an interspecific population suitable for mapping loci for resistance *M. incognita* and *R. reniformis*
  - Original RFLP map of cotton by was based on *G. hirsutum* x *G. barbadense (Reinish et al. 1994)*
  - *G. hirsutum* has $(AD)_1$ genome whereas *G. barbadense* has $(AD)_2$ genome
- Develop *G. hirsutum* genotypes with resistance to *R. reniformis* (E. Zhou)
  - *G. hirsutum* 'M315' used as Root-knot resistant parent (Shepherd et al., 1988)
  - *G. barbadense* 'Tx110' used as Reniform resistant parent (Yik & Birchfield, 1984)

Resistance in F1 generation to Root-knot and Reniform nematodes
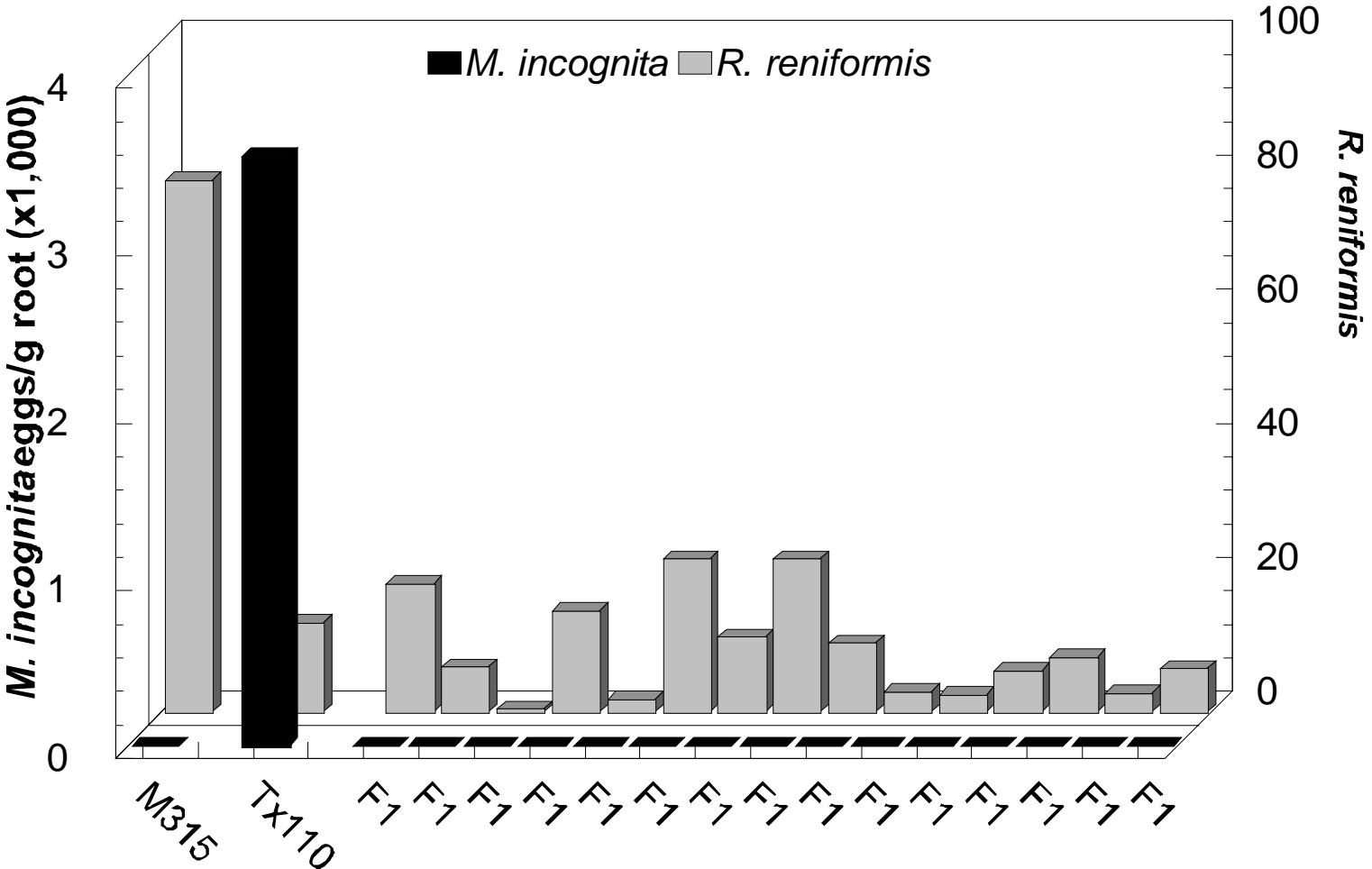
Resistant Genotypes to be Developed from Two Breeding Strategies – Pedigree Program

M315 x Tx110

F_2 selected for day neutrality

F_3 selected for RN resistance

F3 selected for RK resistance

F_4 selected for RN resistance

F_5 selected for RN resistance

K. Ripple advanced material to the F_4 generation

Test 1 – means of each F4:5 family not different from mean of Tx110
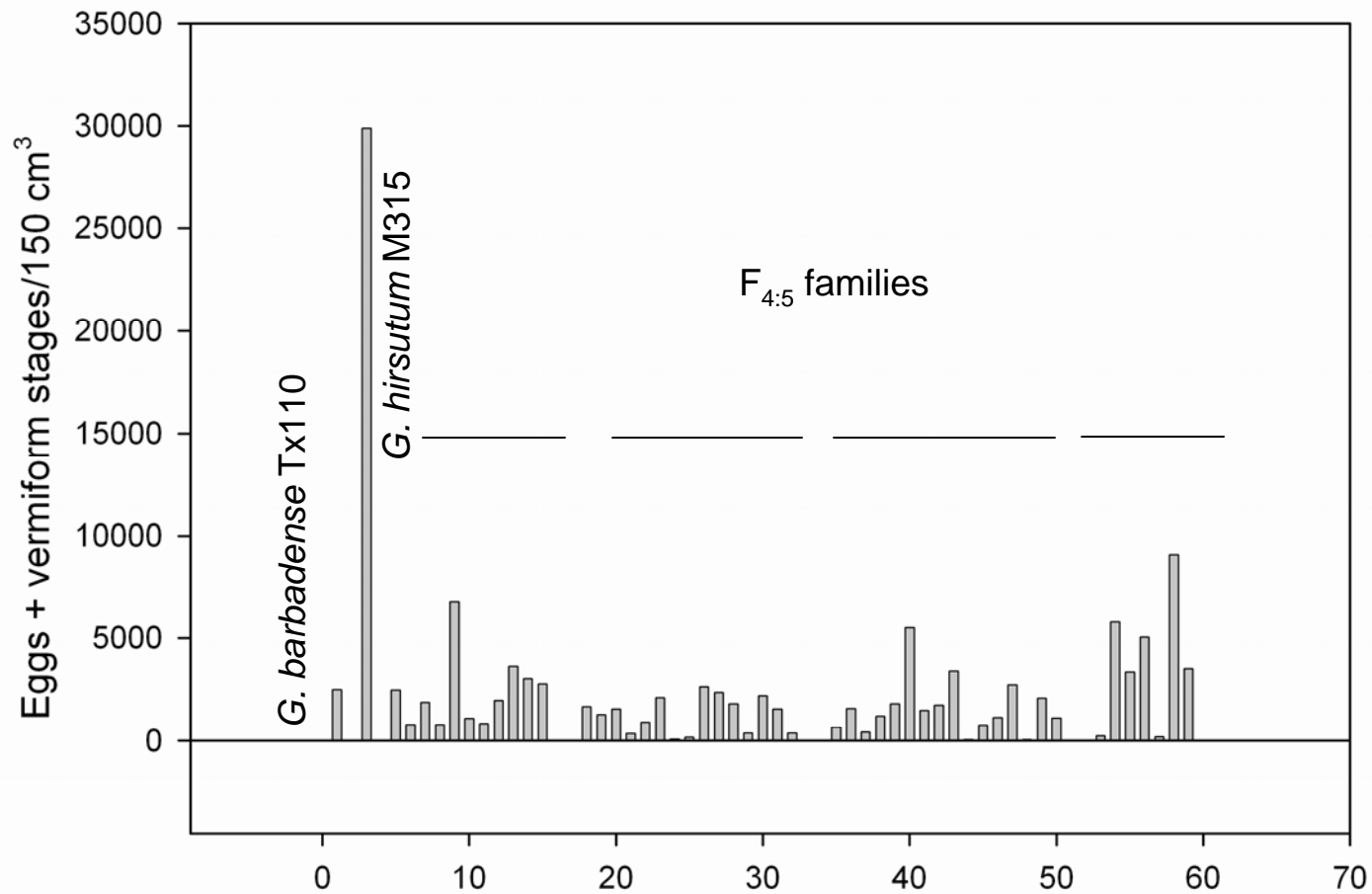
Test 2 – means of F$_{4:5}$ families not different from M315, but resistant individuals selected from each family

Eggs + Vermiforms/150 cm^3 soil

M315 TX110 E F G H
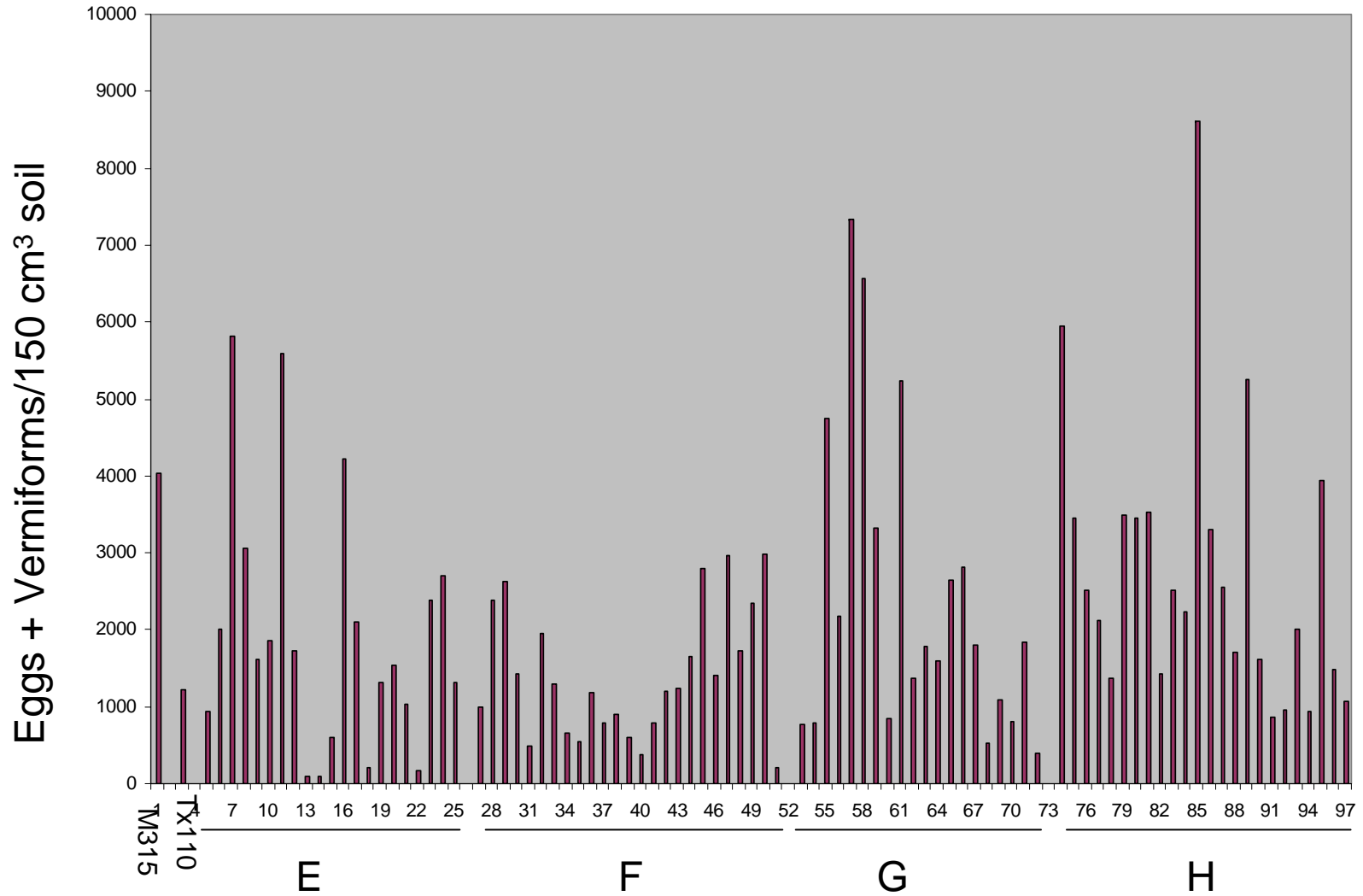
We expected to begin selection for agronomic traits in the F_5 and F_6 generations but unfortunately low fertility in F_5 generation is a real problem!

Resistant individuals were pollinated with pollen from M315 to create a new backcross population

This BC1F1 population is currently being screened for RN resistance and to produce a BC2F2 generation

Four RN-resistant F_6 lines are currently being grown in field plots to select for improved fertility

Backcross Program

M315 *x* Tx110

Rn resistant F2 *x* M315

BC2F2 currently being
screened for resistance to RN
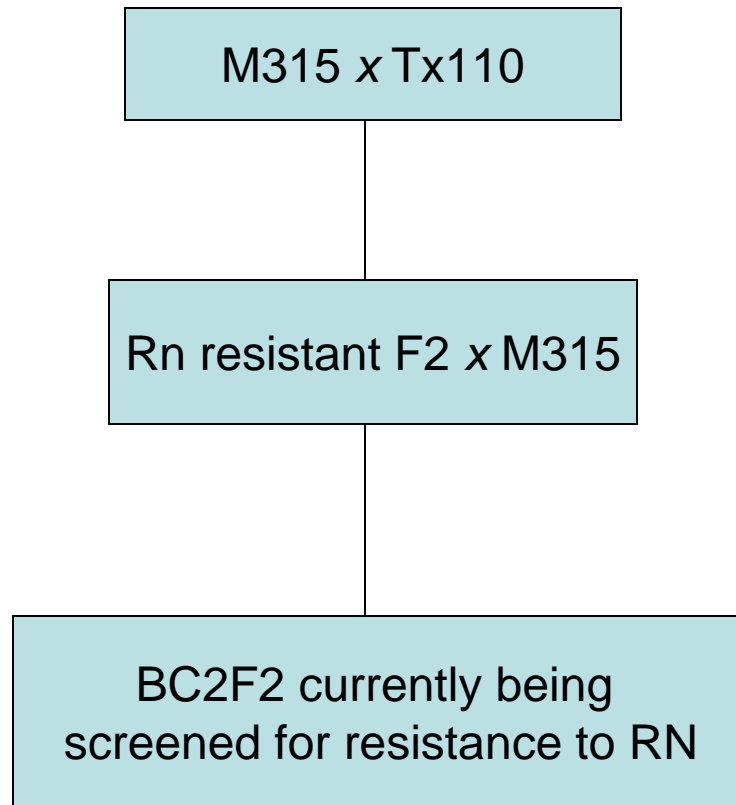
Future Activities

- Complete development and screening of two BC_1F_2 populations
    - Create a BC_2 generation

- If improved fertility can be selected from the F_6 generation, then progeny again screened for RN resistance and agronomic traits