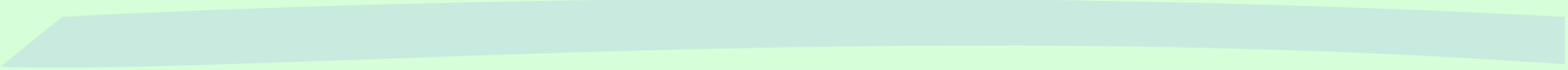


Seed production in
wild American ginseng:
Variation among populations and
with plant size



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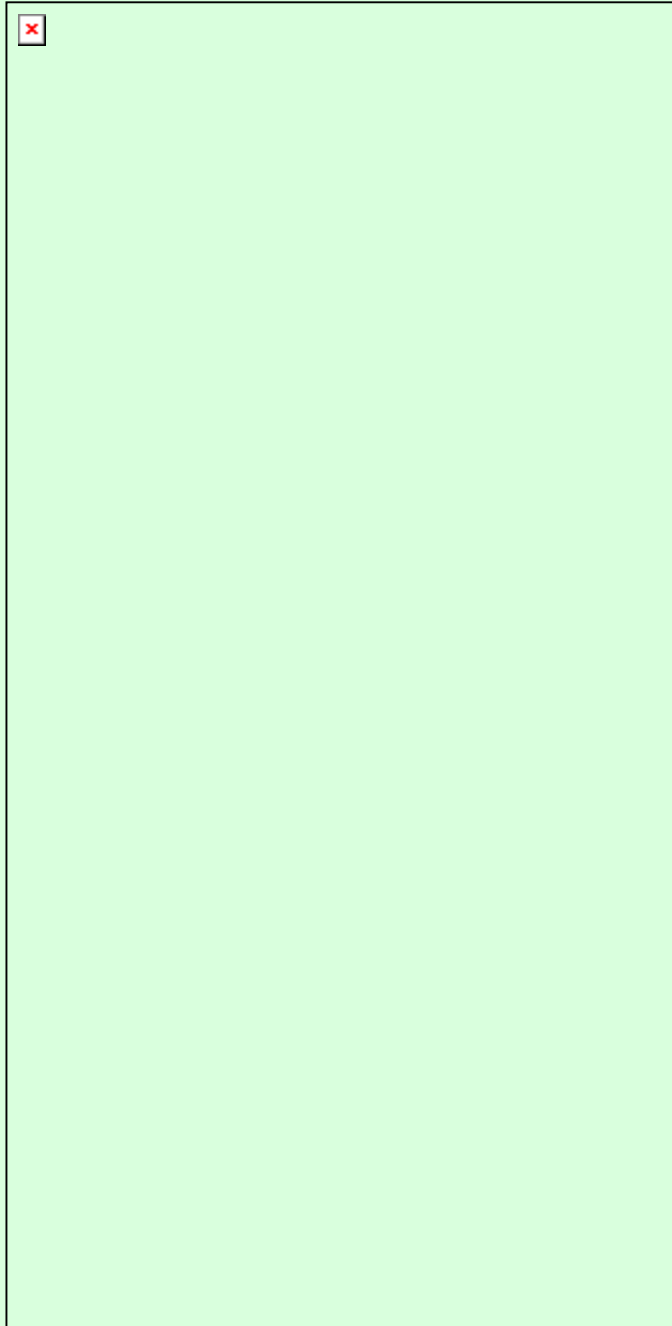
Aaron Rose



Goals:

- To determine factors that limit seed production in wild ginseng
 - Pollination
 - Resources
 - Resource allocation within the plant
 - Herbivory
 - Population genetic structure
- To describe patterns of seed production among and within populations, and among years

Morphology of
American ginseng:



THE SITES: 8 Kentucky populations

4 Western

2 Central

2 Montane



Western Kentucky sites



Crittenden

No photo: Christian



Trigg

Lyon



Central Kentucky sites



Boyle



Garrard

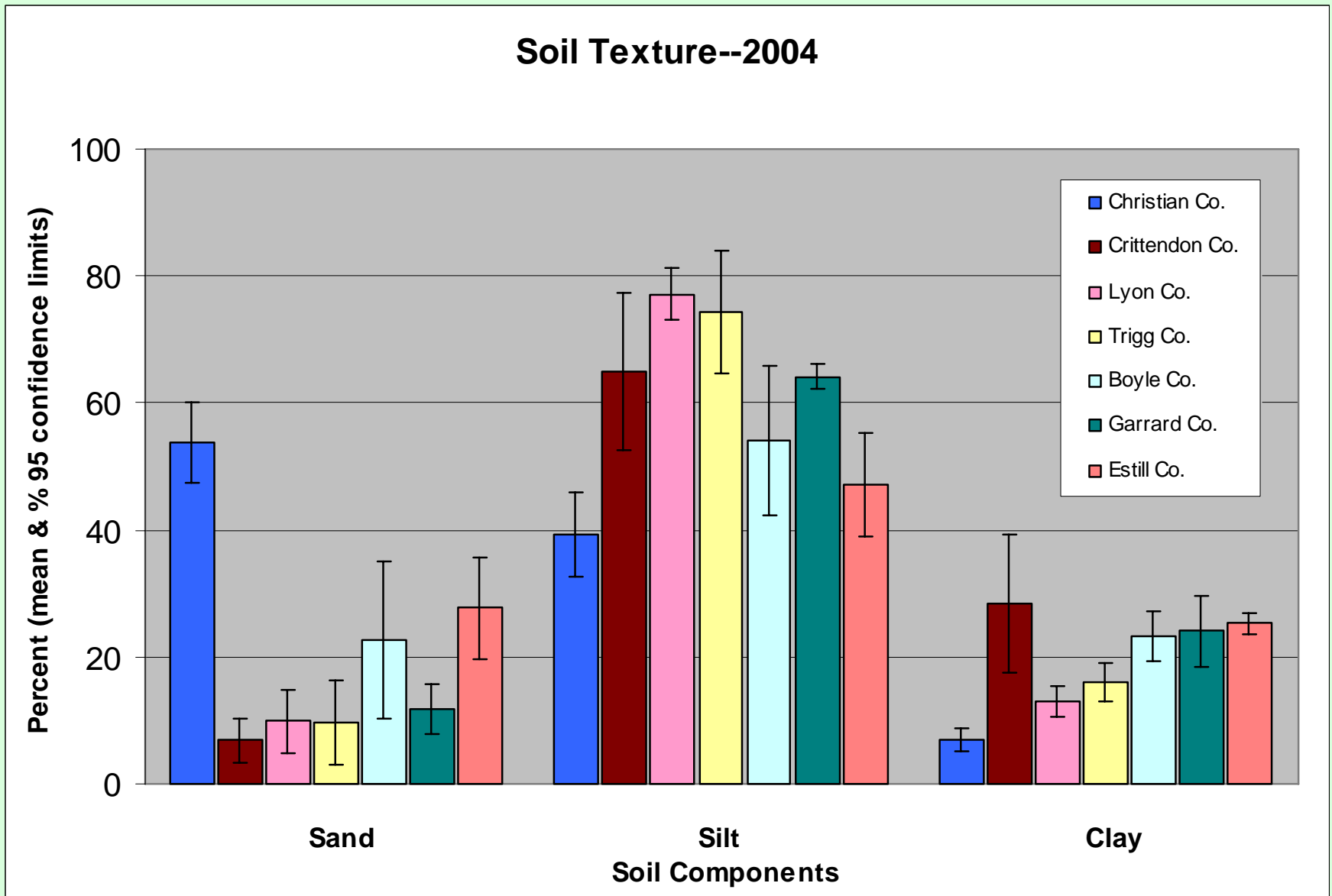
Eastern Kentucky sites



Estill

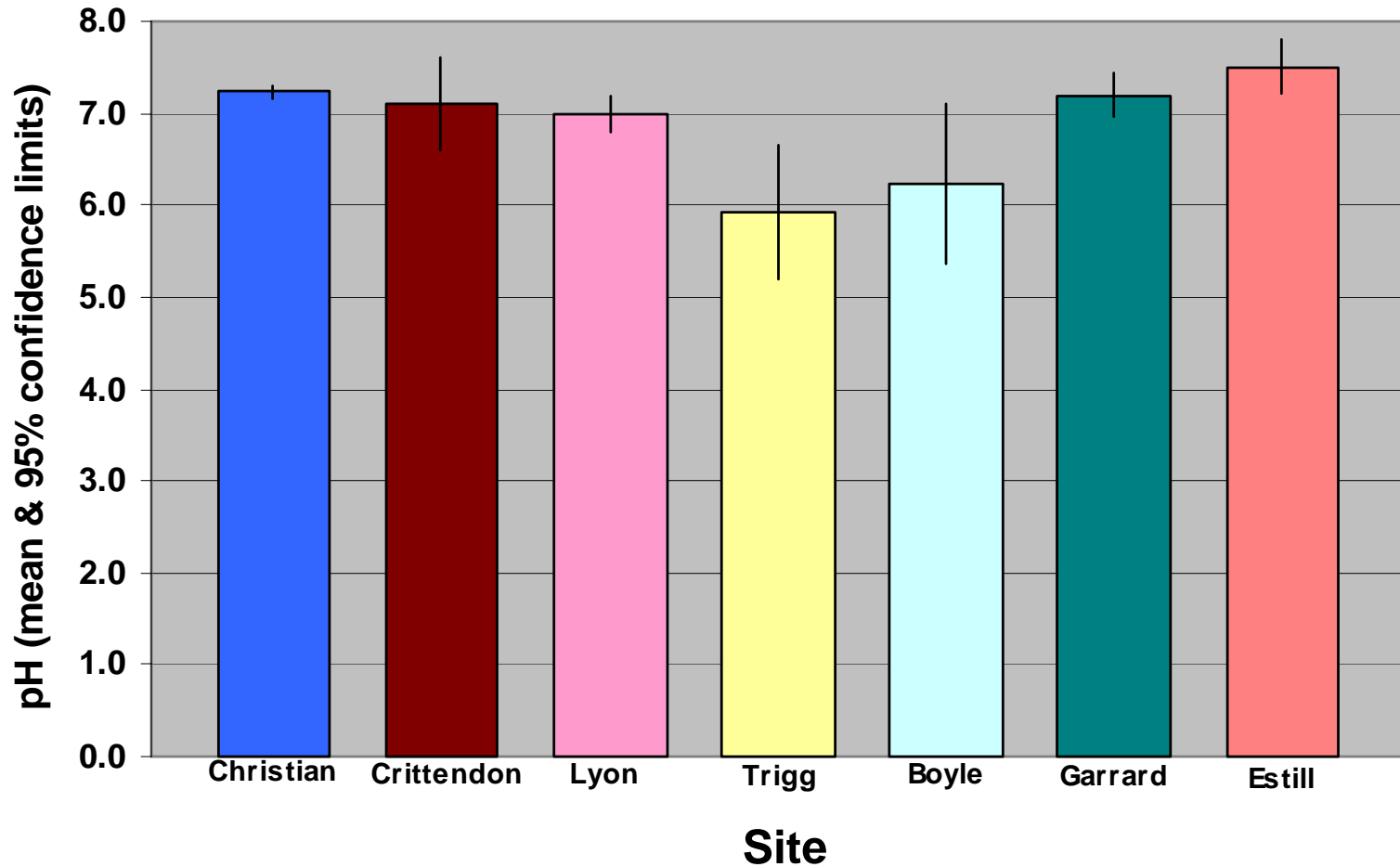
Wayne: no photo

Environmental characteristics: Soils



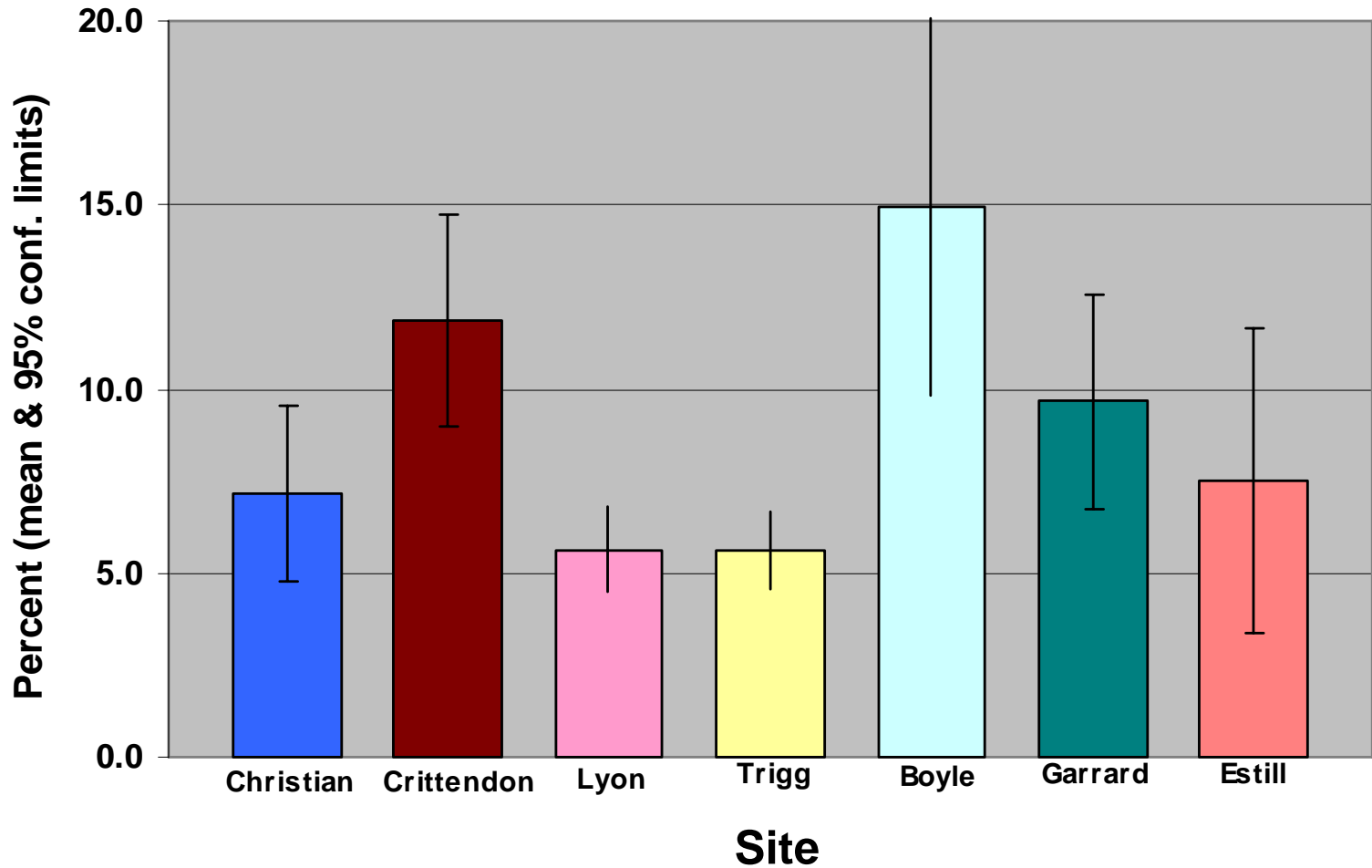
Environmental characteristics: Soils

Mean Soil pH--2004



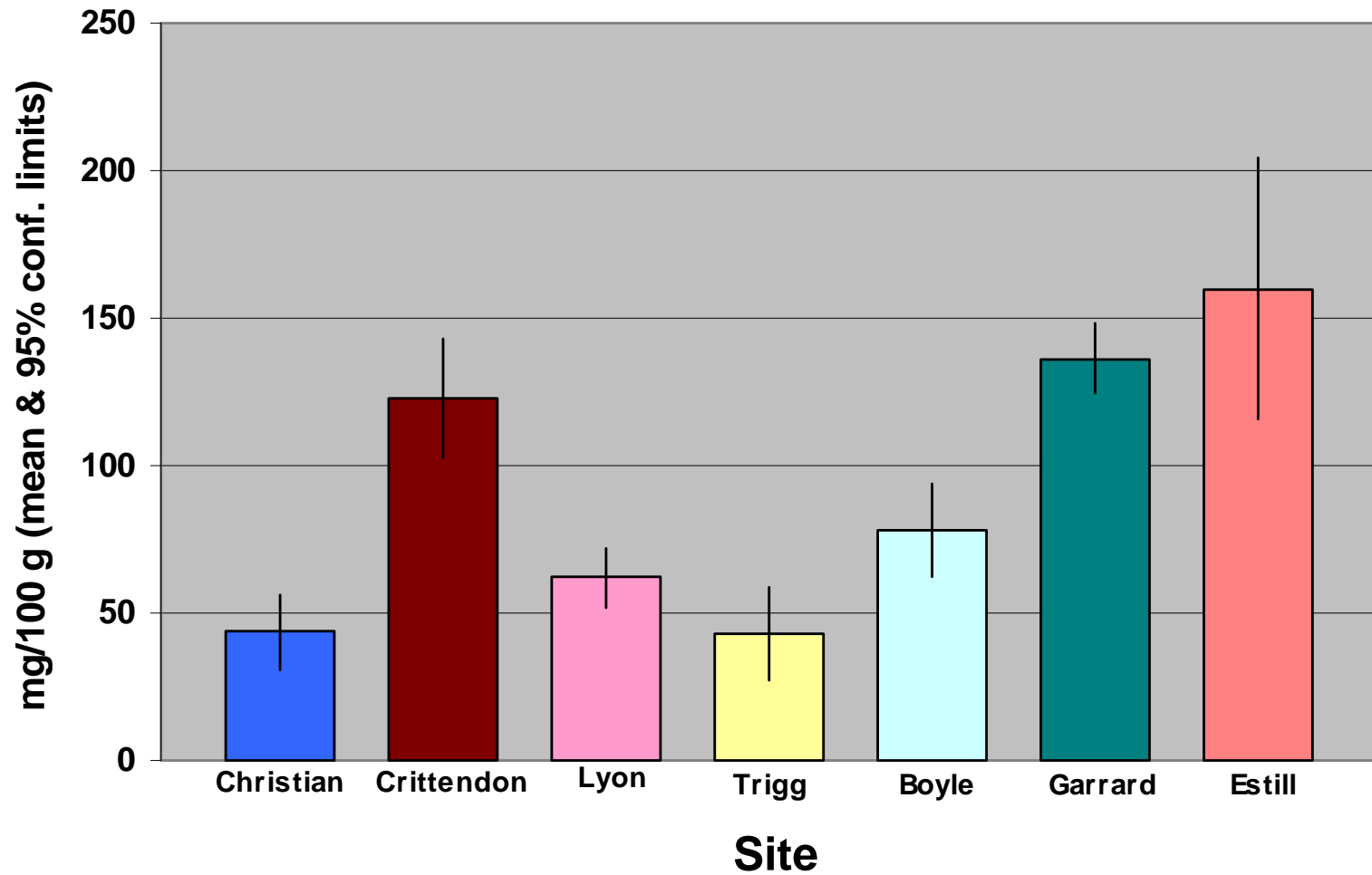
Environmental characteristics: Soils

Average soil organic matter--2004



Environmental characteristics: Soils

Average soil calcium--2004

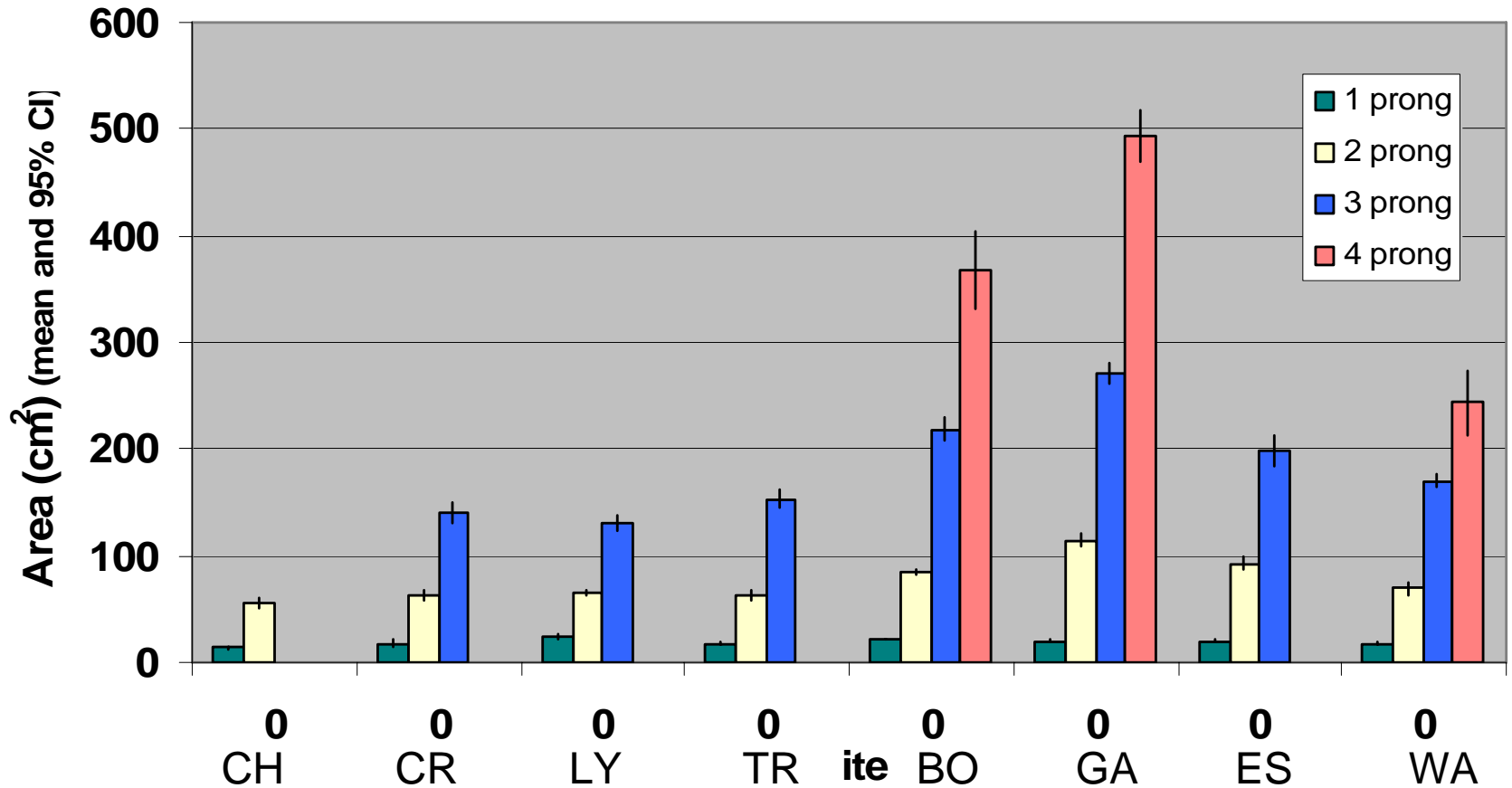


Plant characteristics: Size

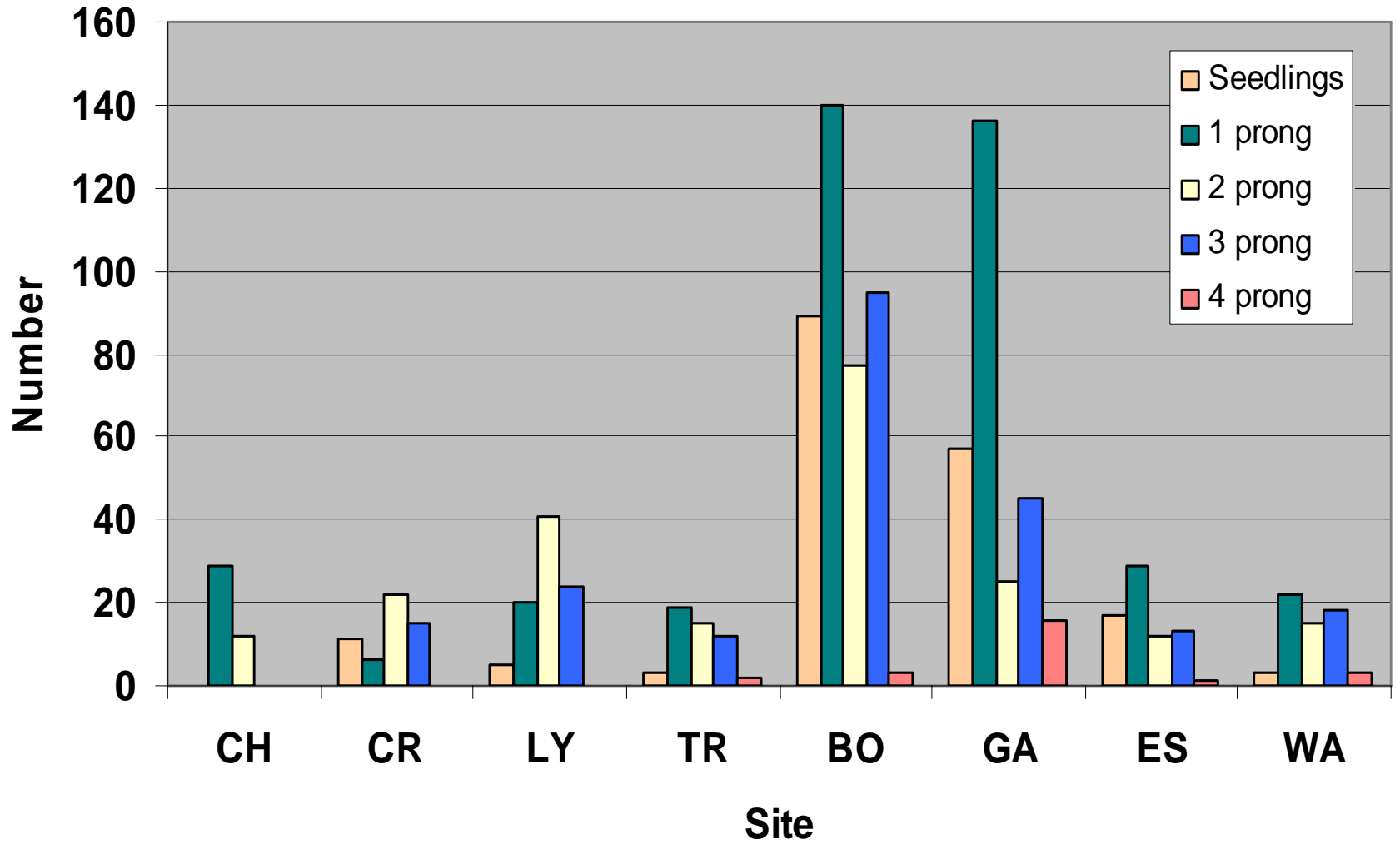


Photograph by Terry Jones

Average leaf area per plant--2004



Size class distribution--2004



Plant characteristics: Reproduction

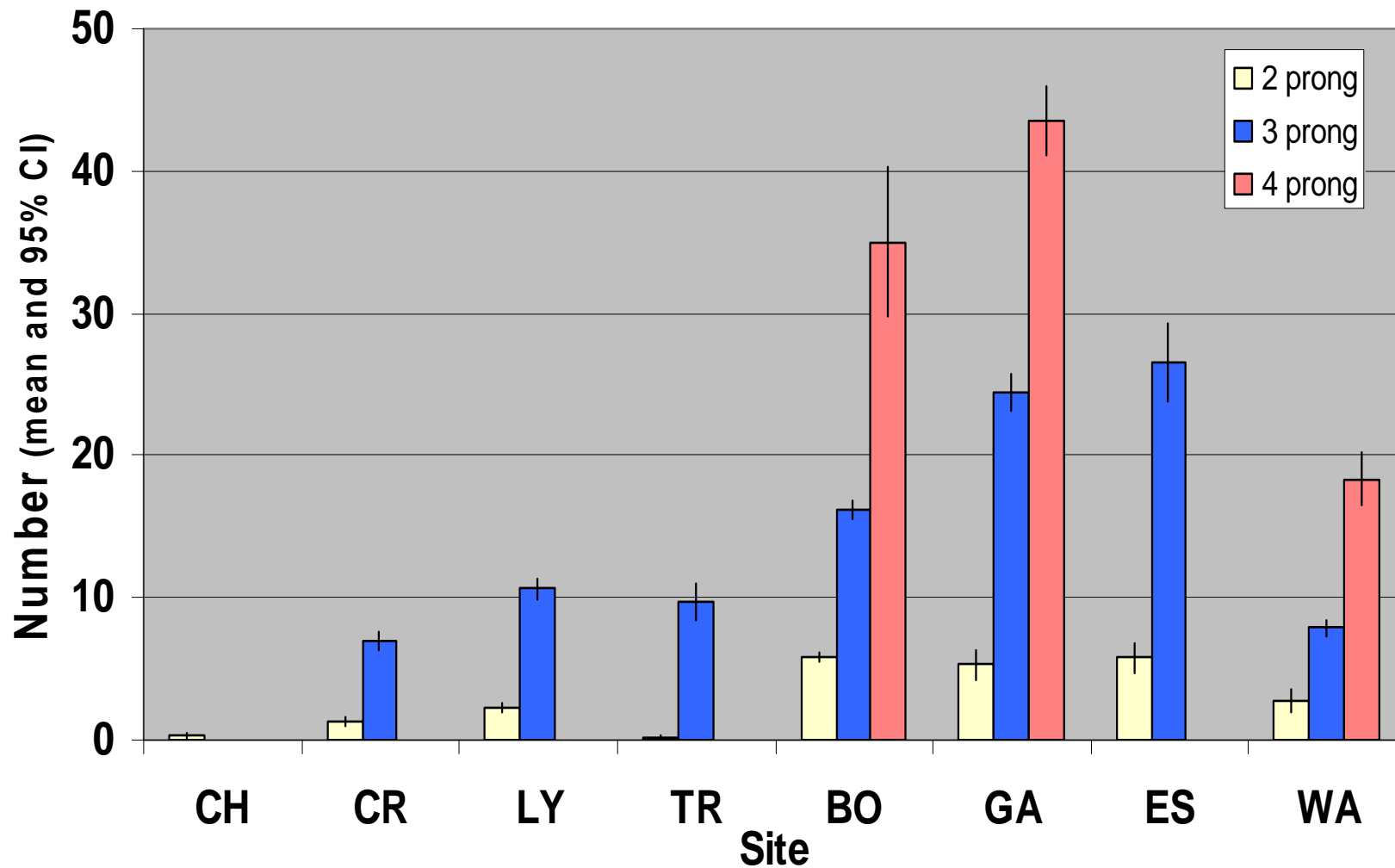


Potential for seed production

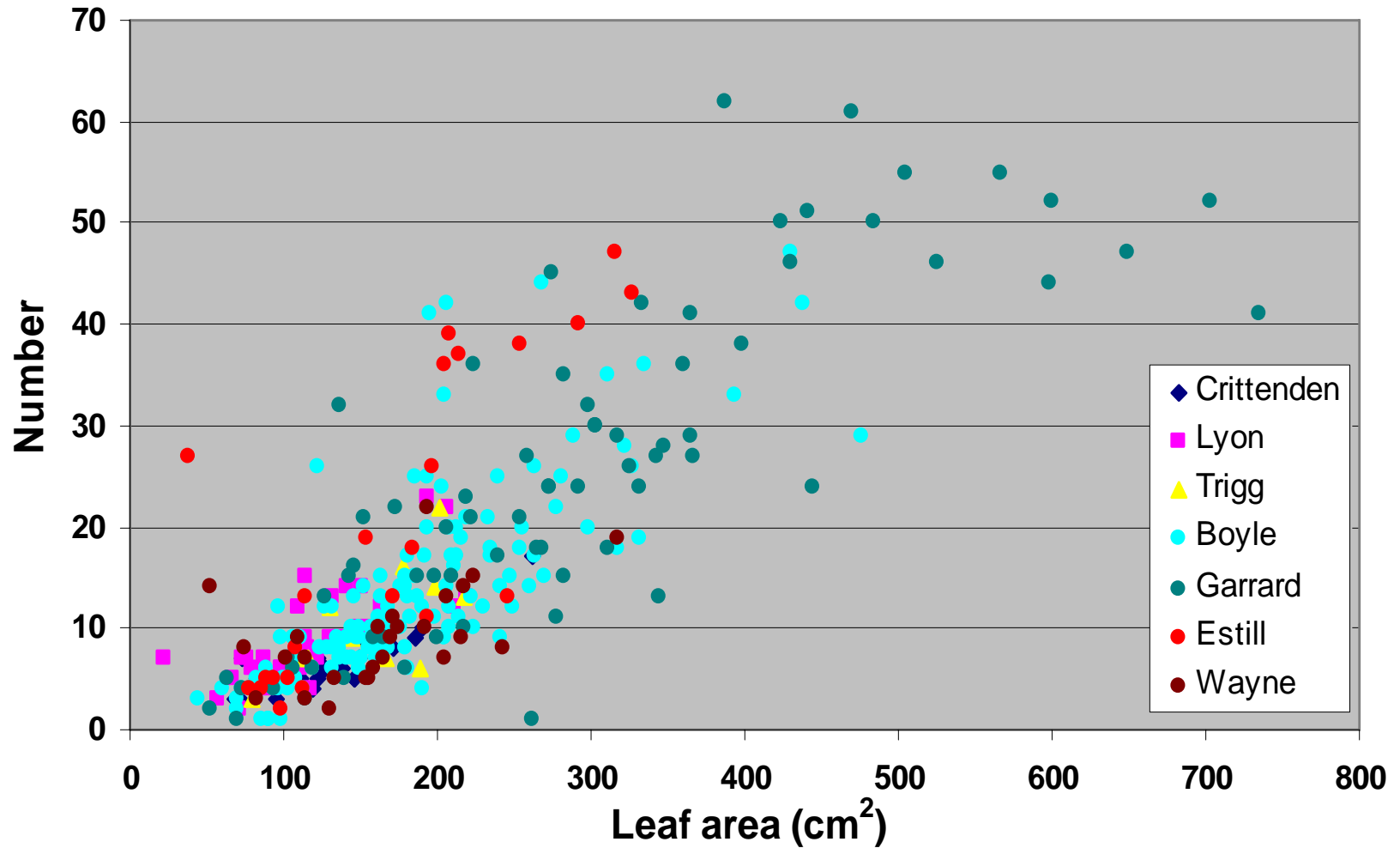


Every fruit
comes from
one flower

Average # flowers per flowering plant--2004

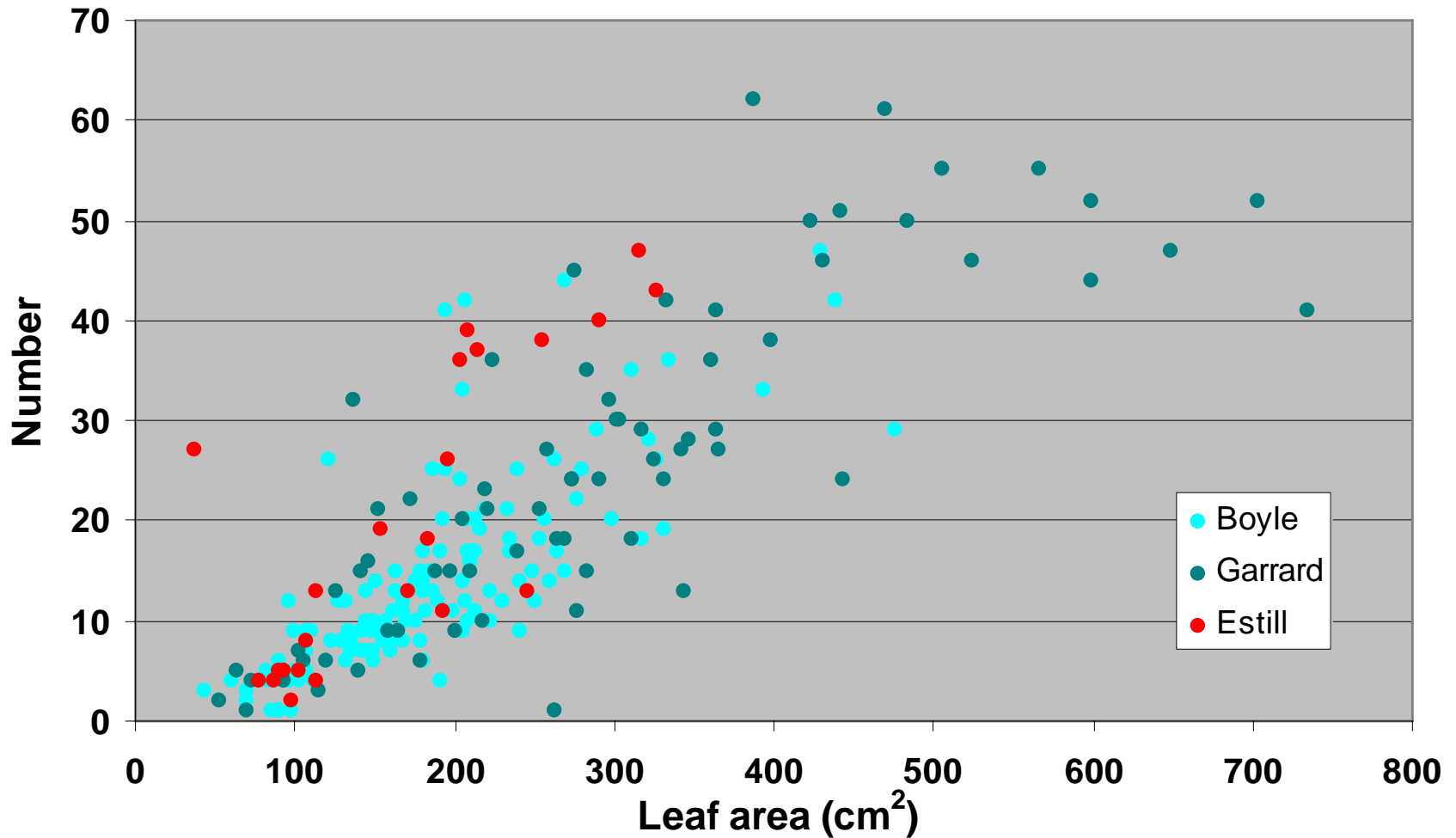


Flower number vs. Leaf area--2004



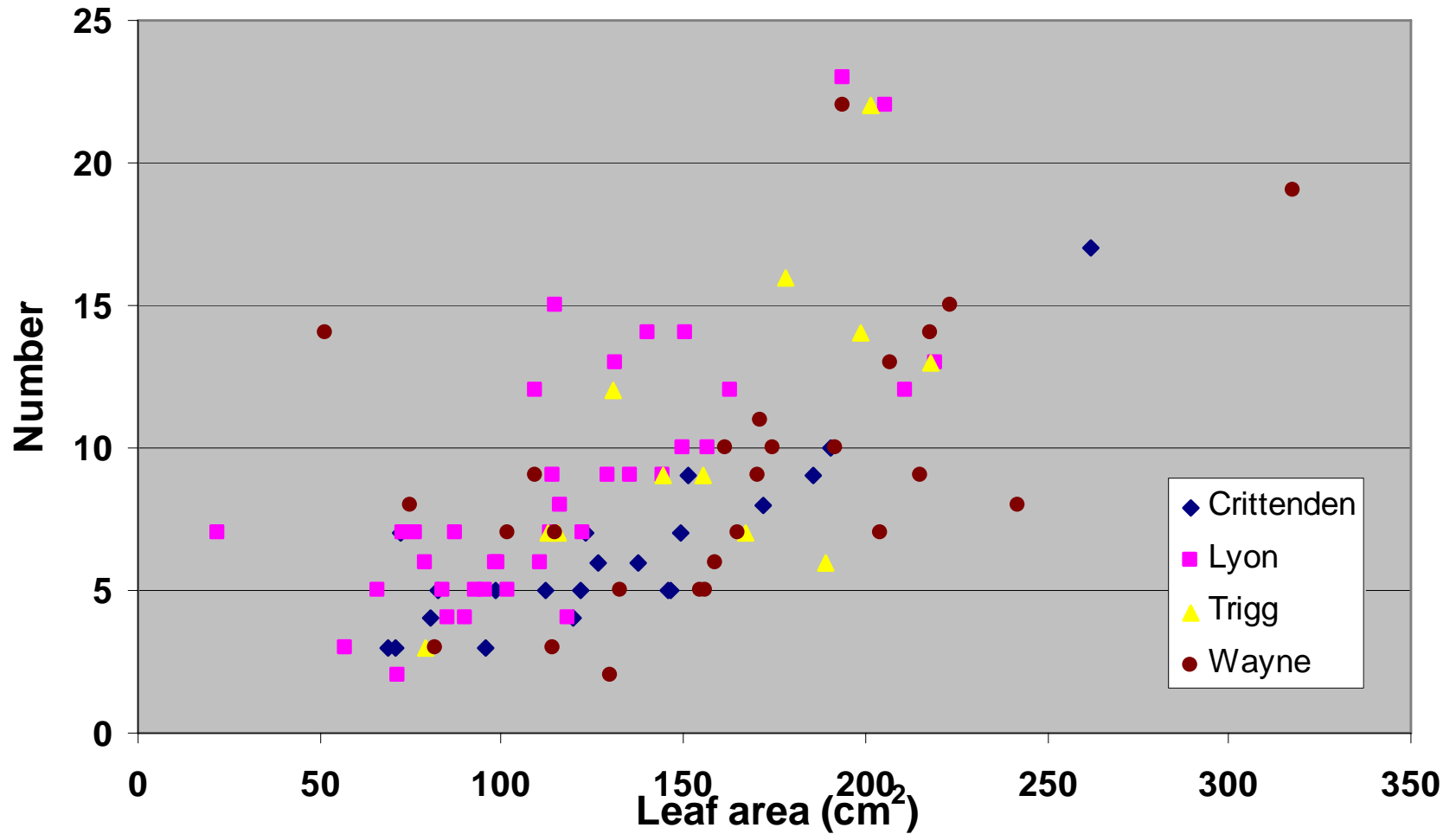
■ All sites

Flower number vs. Leaf area--2004



- Site with large plants

Flower number vs. Leaf area--2004



- Sites with small plants

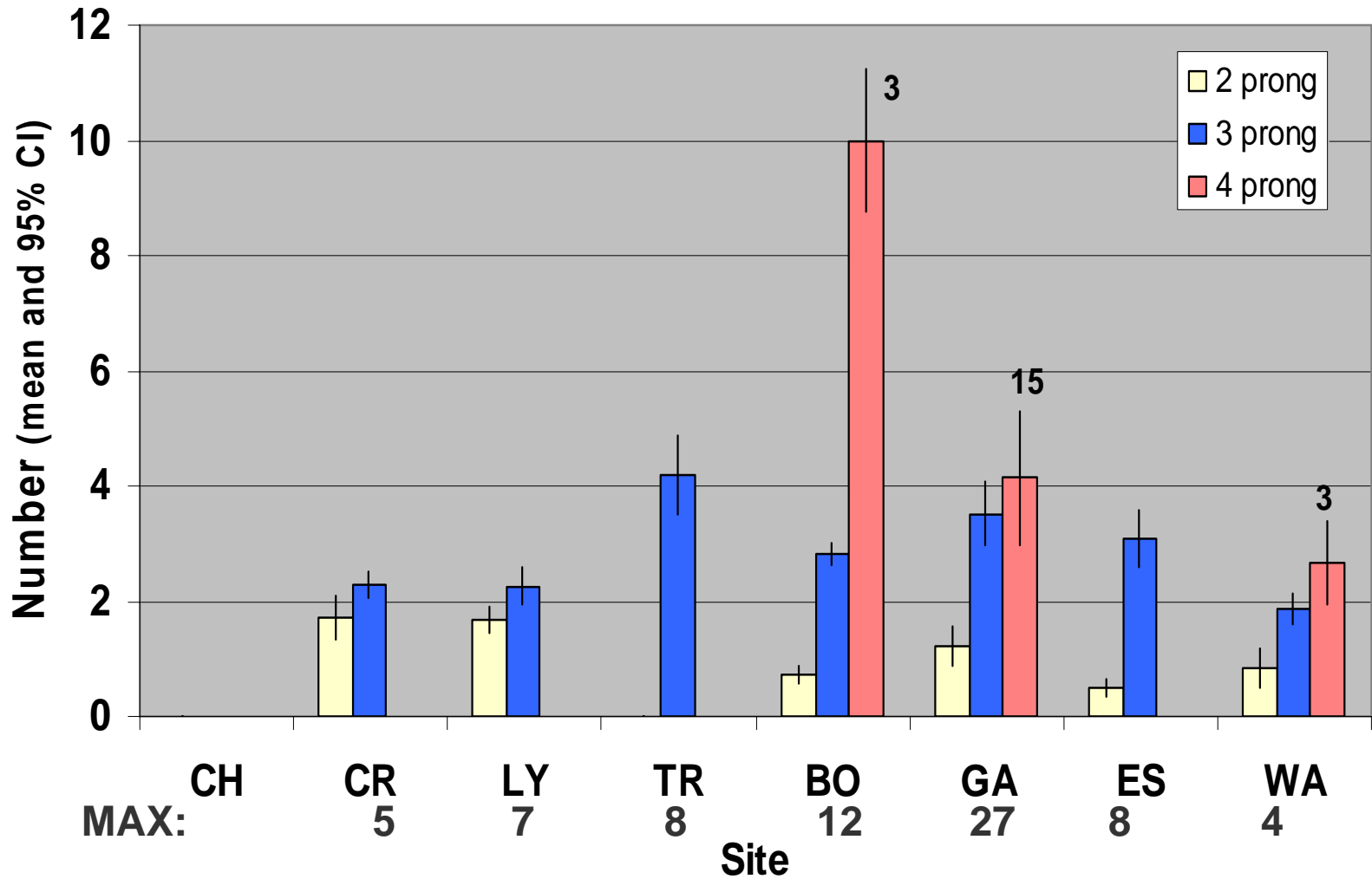
Realized seed production



Each fruit
has 1 – 3
seeds inside



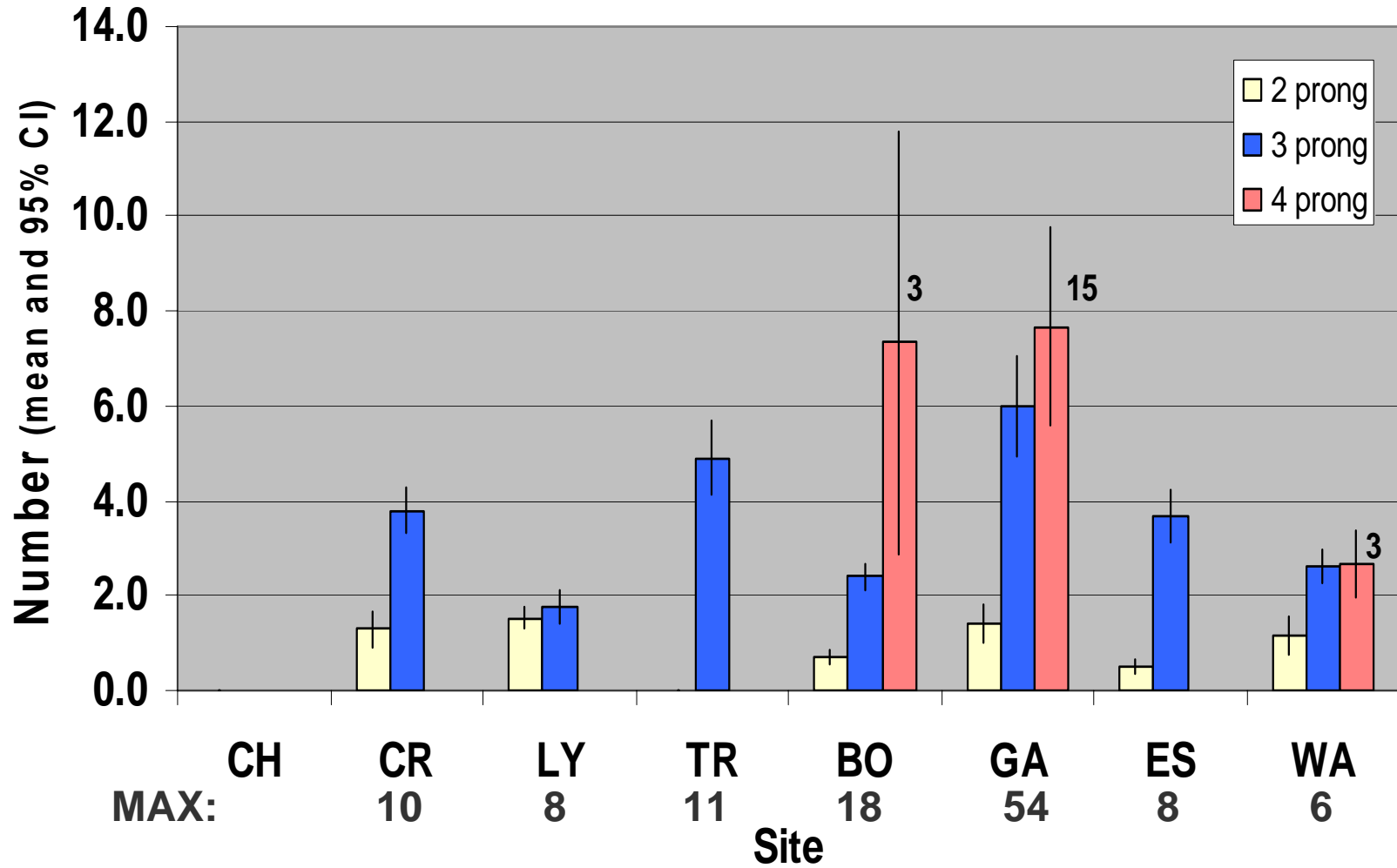
Average # fruits per fruiting plant--2004



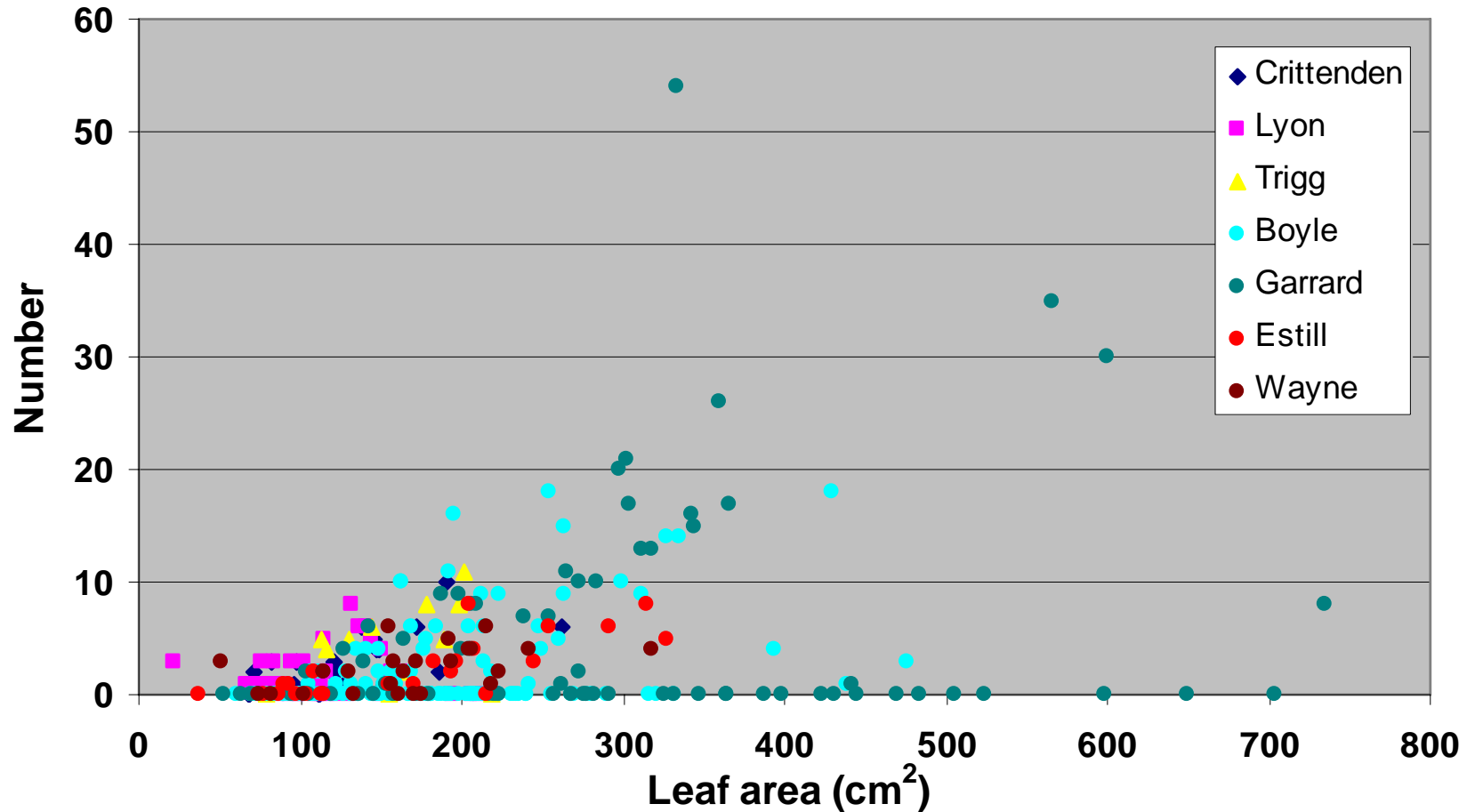
Seedling with seed coat



Average # seeds per fruiting plant--2004

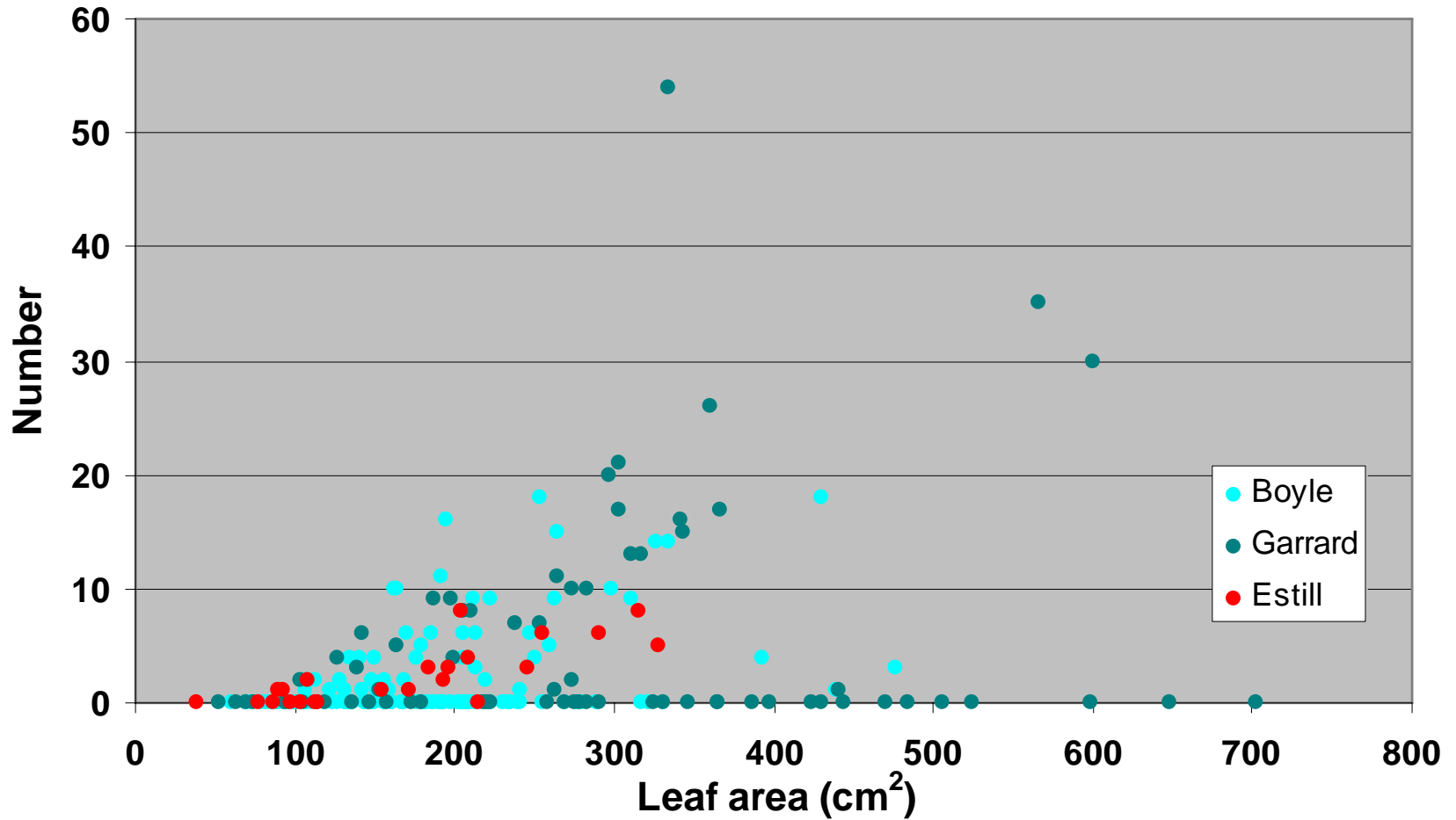


Seed number vs. Leaf area--2004



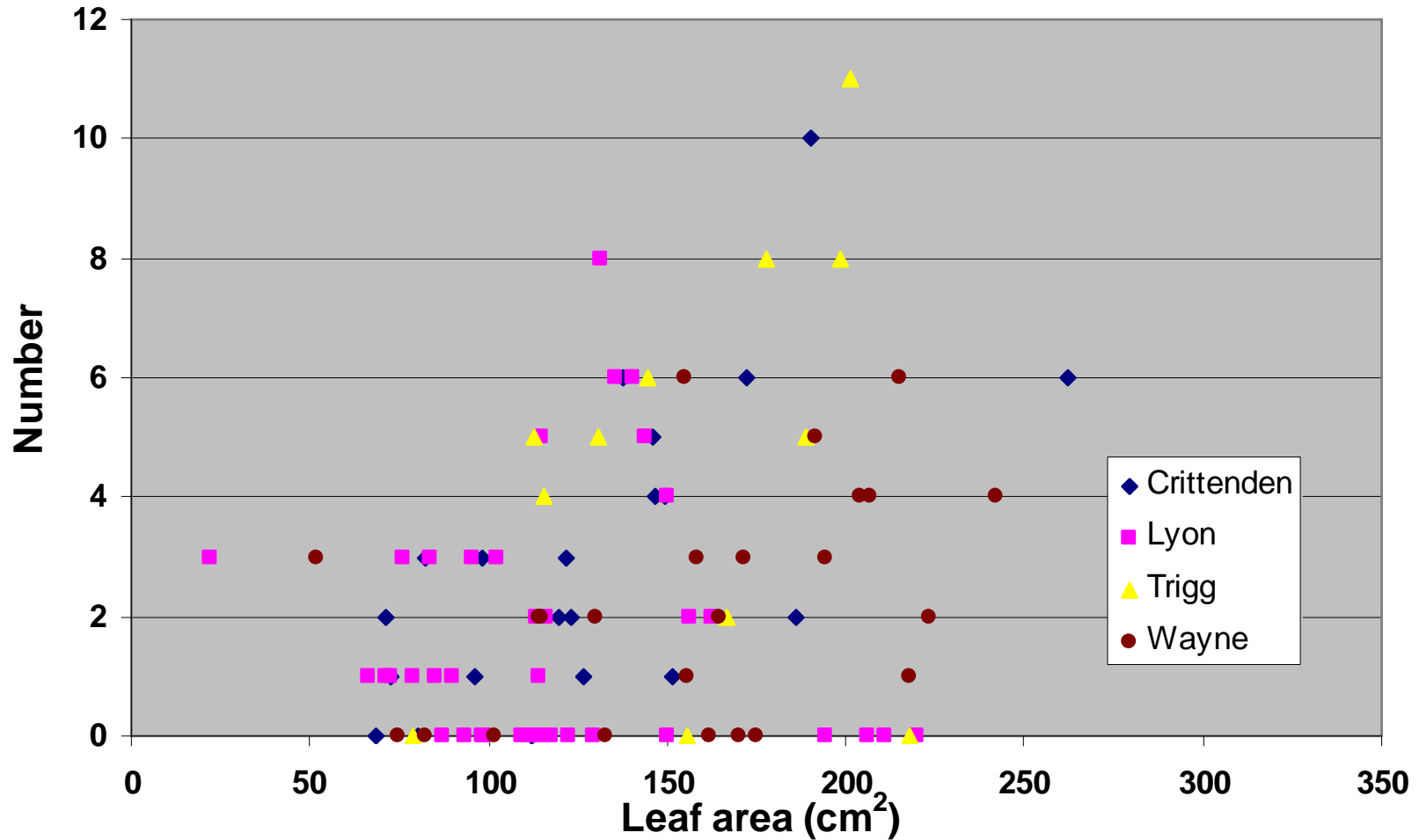
■ All sites

Seed number vs. Leaf area--2004



- Sites with large plants

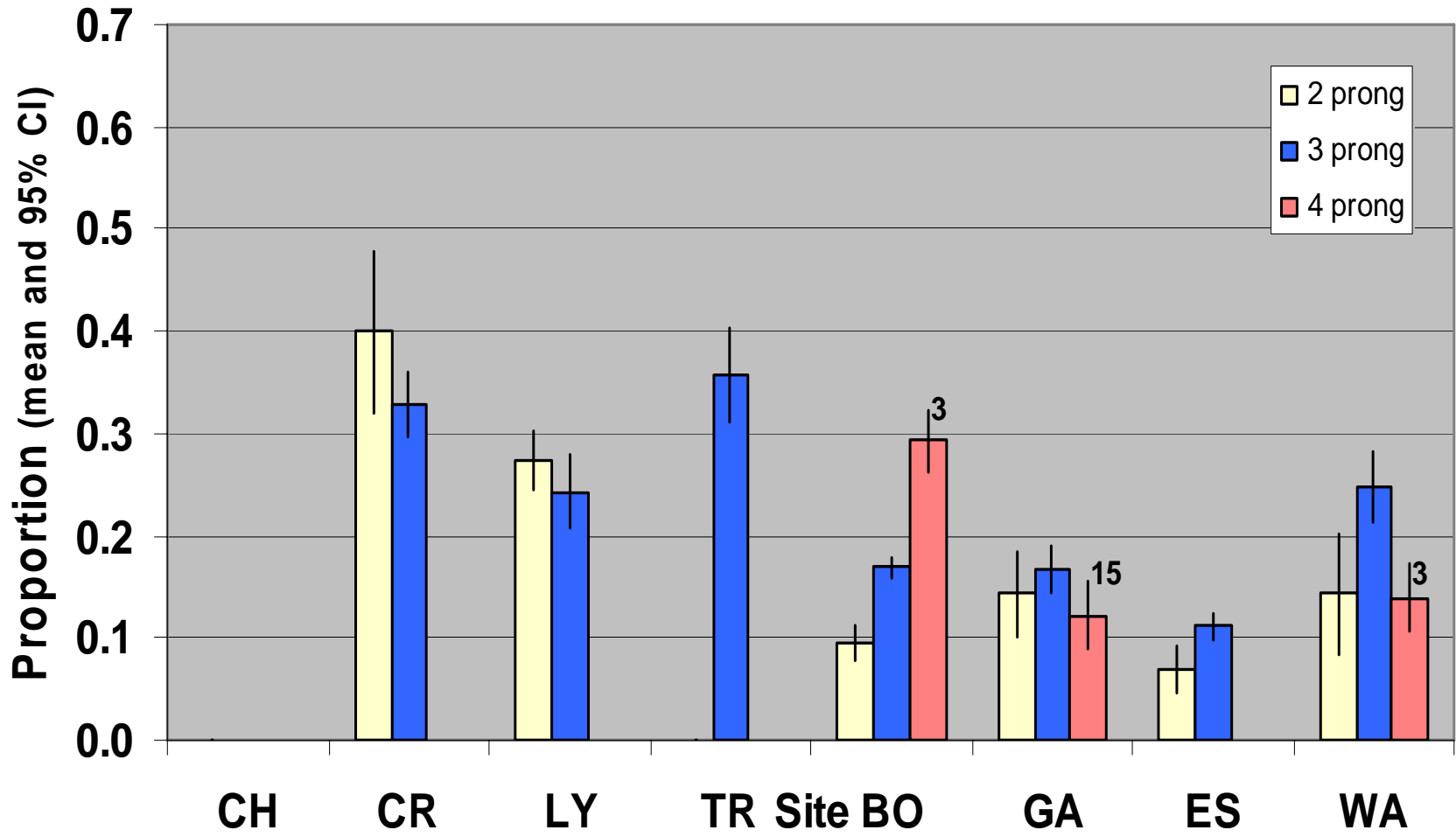
Seed number vs. Leaf area--2004



- Sites with small plants

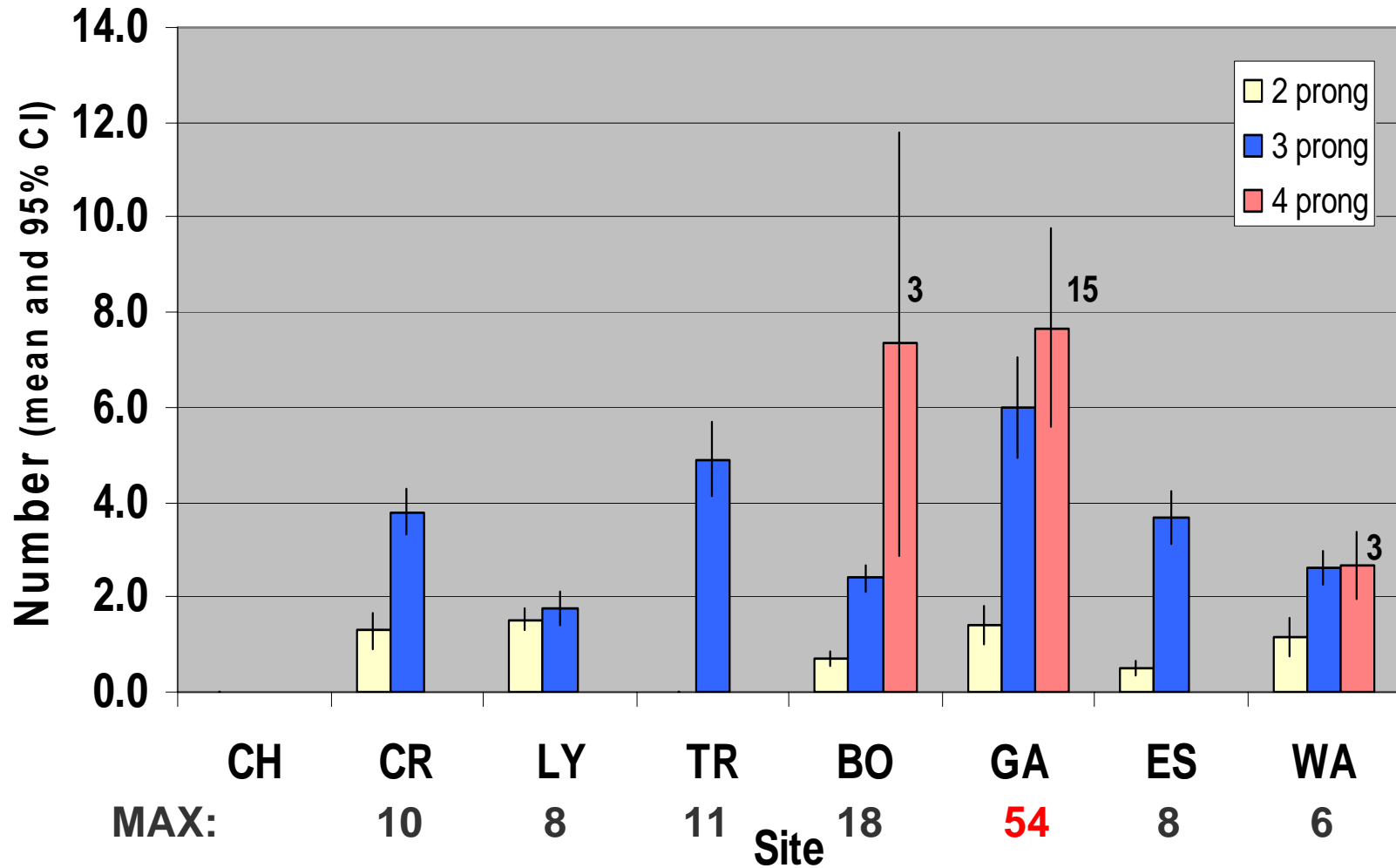
Efficiency of conversion of flowers to fruits

Average fruits per flower--2004

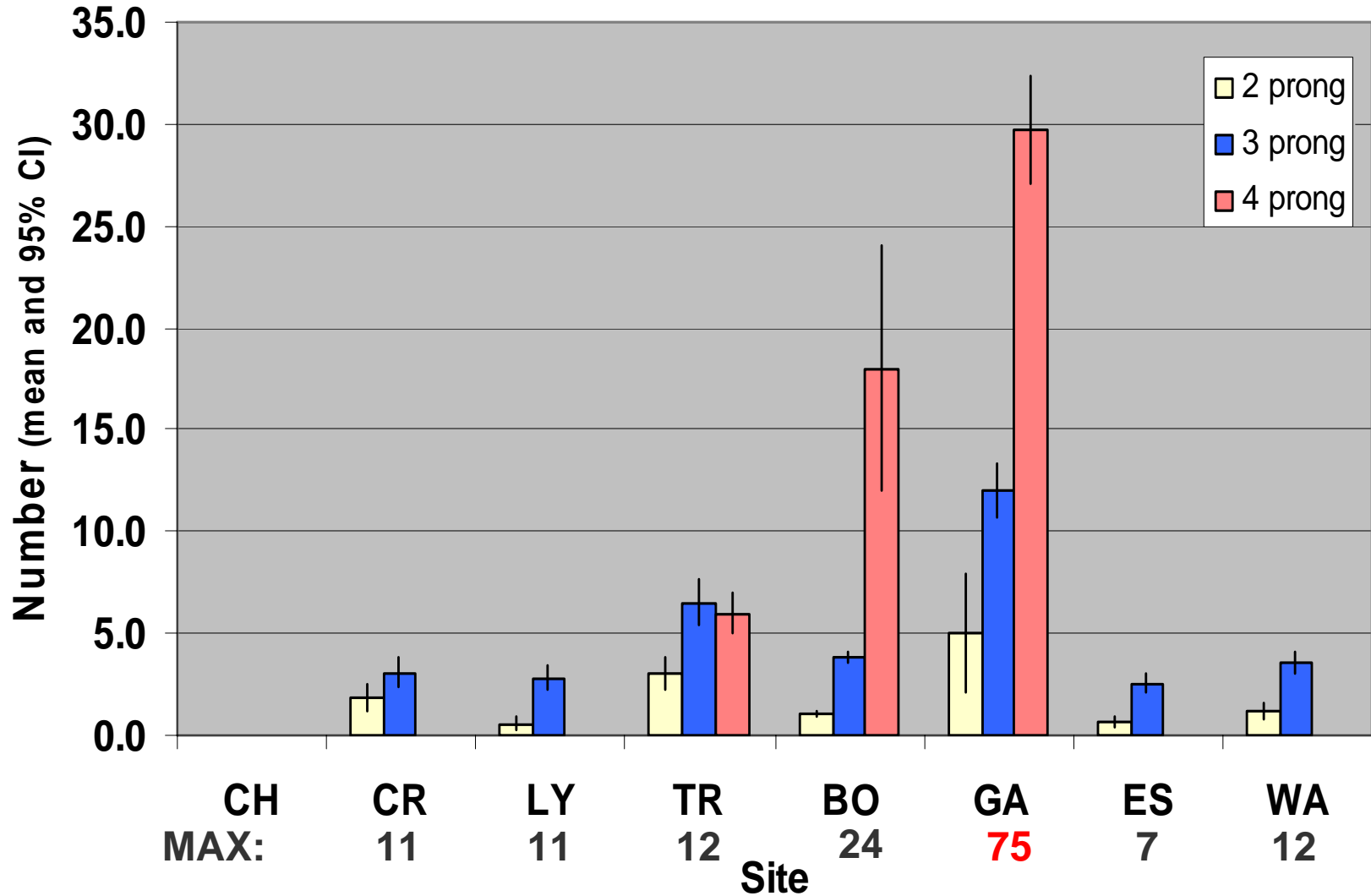


Year-to-year variation

Average # seeds per fruiting plant--2004



Average # seeds per fruiting plant--2003



CONCLUSIONS

- Seed production increases with plant size
 - Harvesters need to leave sufficient number of three- & four-prong plants in place
- Seed production varies among populations
 - Some populations may need more protection than others
- Seed production varies among years
- Seed production is much lower than its potential
 - More research is needed to determine why