Trends in Soybean Traits over Breeding Generations

Many studies on agronomic and seed traits in soybean crops have focused on trait diversity within large germplasm collections rather than regional trends. Phenotypic trait diversity and trends at a breeding program’s scale are poorly understood and scarcely reported due to the confidential nature of most soybean breeding programs, especially in the private seed sector.

In a recent article published in *Crop Science*, researchers report on trends in soybean traits over decades of breeding in two public programs at the University of Guelph in Ontario, Canada. Both seed and agronomic trait trends were assessed and trait correlations compared over time.

This research quantified 13 agronomic and seed traits within 139 pedigree-related cultivars and their historical relatives, demonstrating yield increase in the Guelph and Ridgetown programs at a rate of 17.1 and by 15.7 kg ha\(^{-1}\) yr\(^{-1}\), respectively. Analysis of seed trait correlations show that historical accessions had different patterns of associations compared with the modern cultivars.

Understanding trends in soybean improvement and trait relationships at a breeding program scale allows breeders to make better parental selections while gaining a more complete understanding of the impact of their selections on the phenotypic diversity within the program.


Sustainable Malting Barley and Climate Change

Many people enjoy good beer. In the U.S., brewing is a $351 billion industry that provides 2.2 million jobs. Of this total, the craft brewing industry contributed $76.2 billion and more than 500,000 jobs. Climate change puts this pleasure and positive economic impact in jeopardy.

Authors of a recent article in *Crop Science* address the goal of ensuring the sustainability of producing malting barley (the base of beer) in the face of climate change. The Brewers Association, which represents small and independent craft brewers, challenged the Oregon State University Barley Project to engage in a thought exercise on the feasibility of breeding perennial malting barley. All barley varieties currently used for malting and brewing are annuals. Perennial crops have the potential to provide a range of ecosystem services, and there is impressive progress in the development of perennial forms of cereal crops—notably intermediate wheatgrass.

Perennial malting barley, while an attractive proposition, would require sustained investment and commitment at levels that are difficult to envision in the current funding climate. A more cost-effective, short-term, solution is to support more breeding and management research directed at increasing the sustainability of annual malting barley production.


Diverse, pedigree-related modern and historical soybean cultivars are tested at the Woodstock Research Station (Woodstock, ON, Canada).