Maize Varieties Have Major Differences in Gene Content

DNA sequencing has led to the ability of scientists to discover causal genes for health, growth, rate, productivity, and chemical traits in many species. This is accomplished by comparing DNA differences with measurements of characteristics such as yield, environmental adaptation, and plant health in crop plants.

Discovery of DNA variants has recently been done in the context of a well-curated and expensive genome sequence from a single individual within a species. However, in some species such as maize, the content of genes can vary dramatically with 10% or more genes present in one individual being absent in another. If a gene is absent in the primary reference genome, by most approaches, it is not available to be associated with expression of a trait.

In a recently published article in The Plant Genome, researchers report on the completed sequencing of a new genome of the inbred PHJ89. The authors compared gene discovery using the traditional reference sequence of inbred B73 and an alternative reference genome. The study revealed that the choice of reference genome can be critical and use of multiple references will improve gene discovery. This was exemplified when a virus resistance gene was discovered using a reference that contained the gene, but the gene could not be found using a reference genome that was missing that sequence.


Teachers Find Utility in Instructional Games

Unique and engaging pedagogical approaches like instructional games are crucial for supporting learning opportunities effective to meet the needs of today’s learners. However, as teachers are responsible for the facilitation of instructional games, the perspectives of teachers are critical to the effectiveness of the learning experience.

A recently published study in Natural Sciences Education explores the perceptions, attitudes, and competence of secondary school agriculture, food, and natural resource (AFNR) educators regarding the use of instructional games as a teaching tool. The researchers found two predominant factors supporting teacher utilization of games during instruction: utility value and competency beliefs. Other factors such as lack of clear student learning outcomes and resource costs may inhibit teachers’ use of games to educate.

The results suggest AFNR educators, and educators in other science-based fields, should consider incorporating games within their instruction. Additionally, as instructional games are perceived as beneficial, and educators may have low competency beliefs or desire more gaming options, professional development opportunities should be developed to meet the instructional gaming needs of educators.


Maize diversity panel in the field. The lines have been densely genotyped, resequenced, or assembled in one form or another.

Michigan educators participating in instructional game-based professional development.