The NDSU Corn Breeding and NDSU EarlyGEM Programs: Increasing the Genetic Diversity of Short-Season Corn.

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NEW SHORT-SEASON (85-90RM) NDSU EARLYGEM RELEASES
LINES: ND2024, ND2026, ND2027 (all non-SS)
New NDSU EarlyGEM populations released in 2012 are being tested in diallel and North Carolina II mating designs with North Dakota Stiff Stalk and non-stiff Stalk versions. They are also being improved with intra- and inter-population recurrent selection methods that integrate pre-breeding with cultivar development. EarlyGEM populations and lines are also being tested for value-added properties for ethanol and its bi-products utilization as well as for nutritional properties. NDSU has received fees and royalties.

Thousands of early generation EarlyGEM lines have been screened under controlled winter nursery conditions for cold and drought tolerance. Selected late generation lines have been tested in hybrid trials with GMO industry testers across over 50 public and private northern U.S. environments. Public x public non-GMO hybrid combinations are being produced in our 2013-2014 winter nursery including EarlyGEM, ex-PVP, and traditional NDSU short-season hybrids. This NDSU corn breeding subproject addresses the need for increasing the genetic diversity and value-added of northern U.S. hybrids. The common and diverse gene pool will add unique genes to the corn genomes already sequenced (e.g., B73, NAM, etc.) for all traits. Our intention is to develop a common and diverse gene pool for northern U.S. to significantly increase productivity without reaching a bottleneck in genetic diversity.”

2013 OUTREACH, PUBLIC RELATIONS AND FIELD DAYS:
Keynote Lectures and Invitations with exposure to NDSU EarlyGEM data:
• January: Minnesota Corn Research and Promotion Council, US
• February: North Dakota Corn Utilization Council and Minnesota Corn Growers Association, US
• March - April: Several private and public institutions, Argentina and New Zealand
• August - September: Private and public institutions from Puerto Rico, China, and Germany.

Fargo, ND North Dakota State University (M. Carena) 2013 Field Days:
• Over 100 people touring winter nurseries for seed production and screening for cold and drought tolerance with thousands of NDSU EarlyGEM new genetic materials.
• In 2012-13, I had 4 Ph.D. students as major advisor, 12 students as instructor in Quantitative Genetics, 16 students as instructor in Crop Breeding Techniques, where EarlyGEM products and procedures were directly exposed.
• >500 national/international nursery visitors, and main consultant to several institutions, toured summer breeding nursery with new NDSU EarlyGEM line and population releases.