



International Conference

FROM SEED TO PASTA III

A SUSTAINABLE DURUM WHEAT CHAIN
FOR FOOD SECURITY AND HEALTHY LIVES



Bologna - Italy, 19-21 September 2018

SELECTION FOR UNIFORM GRAIN DIMENSIONS AND GERMINATION DURING WHEAT DOMESTICATION

Moran Nave, Raz Avni, Yago Hale, Assaf Distelfeld

Universities/Research Centers of Affiliation Tel Aviv University

Presenting Author: Moran Nave

Seed dormancy can increase the probability of survival of at least some progeny under unstable environmental conditions. In wild emmer wheat, only one of the two grains in a spikelet germinates during the first rainy season following maturation; and this within-plant variation in seed dormancy is associated with both grain dimension differences and position within the spikelet. We identified a major locus on the long arm of chromosome 4B, designated *QGD-4BL*, which explains >40% of the observed variation in grain dimensions and seed dormancy within spikelets. Using two sets of wild emmer introgression lines and a wild emmer genome assembly we delimited *QGD-4BL* to a 16-Mb region. Global allelic variation study using wild and domesticated genotypes showed that *QGD-4BL* was under selection during wheat domestication. The domesticated variant of this novel locus on chromosome 4B favors spikelets with seeds of uniform size and synchronous germination. We have recently identified wild emmer populations that exhibit uniform seed size within a spikelet. These uniform-grain genotypes may represent the primary wild genetic material that was used during wheat domestication. The identification of *QGD-4BL* and these uniform wild genotypes enhance our knowledge of the genetic basis of the domestication syndrome of one of our most important crops.

ABSTRACT