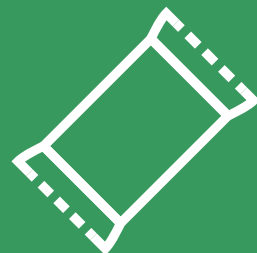


Seed-X

# Astonishing results in a variety of applications

**Food Production**

[Seed-X.com](http://Seed-X.com)





SeedX

## Determine quality traits in bread wheat grains

Concentration and composition of grain protein and microelements

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### Target: Use Seed-X non-destructive screening to determine quality traits in bread wheat grains

EcoBreed and Seed-X collaborate to improve grain quality using with the goal of improving wheat grain quality using Seed-X unique GeNee™ technology and EcoBreed proprietary germplasm. Grain protein and microelements concentration and composition is an important quality measure which defines nutritional value.

The concentration and composition of grain protein and microelements constitute an important quality measure of nutritional value.

A set of unique landraces, comprising a wide range of nutritional quality measures (protein and microelements content), was selected: 26 bread wheat lines, 21 unique landraces and 5 commercial varieties. This genetic collection was grown under the same conditions by EcoBreed and characterized for different quality traits, such as protein content and different microelements, including Mg (Magnesium), Zn (Zinc) and K (Potassium).

Grains of all lines were captured and used to train Seed-X seed-level AI-driven phenotyping system to identify unique signatures in each line. These signatures were then used to classify the lines across 10 clusters (see table and figure below). These clusters were found to credibly correlate with lines' quality measures, i.e., lines within each cluster are ascribed with nutritional values that are more similar to those held by external lines. .

Summary of results [Next Page](#)



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## Summary of results

**Cluster 1** includes 4 of the commercial varieties present in this study. It can be seen that it presents low quality - low protein units 11.9, and low Mg 1026 ug per seed. On the other hand, this cluster has large grain size that correlates with high yield. **Cluster 3** includes 5 landraces. It presents medium quality - protein 14.2, and Mg 1370 mic g and medium grain size. **Cluster 8 and 10** - each includes 2 landraces, both clusters present small grain size with a high level of Mg, over 1500 mic g, cluster 8 present high level of protein while cluster 10 holds moderate to high protein levels. .

Cluster Number	# of lines in the cluster	Ug per Seed	Protein (%DW) Units	Seed area mm
1	4	1026	11.9	19.3
2	2	1139	13.0	18.8
3	5	1370	14.2	15.2
4	1	1344	14.3	15.9
5	2	1338	16.8	15.4
6	1	1412	21.2	18.6
7	7	1460	15.1	14.0
8	3	1539	16.4	14.3
9	2	1480	16.9	20.3
10	2	1536	15.5	14.4

Table 1: Summary of the different clusters created using the seed images average quality parameters

### Dendrogram

**Cluster 1:**  
Low Protein, Low Mg.,  
Large Grain

**Cluster 3:**  
Protein Medium,  
Mg. Medium, Grain  
Medium

**Cluster 8:**  
Protein High, Mg. High,  
Grain Small

**Cluster 10:**  
Protein Medium, Mg. High,  
Grain Small

