

## Hard White wheat “Clear White”

### DEVELOPMENT

Clear White was developed by the University of California wheat breeding program lead by Dr. Jorge Dubcovsky and research associates Oswaldo Chicaiza and Lee Jackson. Selection for disease and pest resistance, yield, and quality was conducted at the Sacramento and San Joaquin valleys. Funding for this project came from the University of California, the California Wheat Commission and the California Crop Improvement Association.

### BREEDING HISTORY AND DESCRIPTION

Clear White is a short-stature hard white spring common wheat with an early season heading time and good resistance to shattering and lodging. Clear White was selected from the cross UC365/Yecora Rojo//Klasic. Bulk populations of F<sub>2</sub> through F<sub>10</sub> generation seed were grown in Davis from 1983 through 1996. Individual heads were planted in single F<sub>11</sub> family headrows in 1998. Based on their agronomic appearance, thirteen headrows were selected and tested in a single-rep observation yield trial in 1999. Based on yield and protein values, four siblings were selected and advanced to preliminary yield trial in 2000. One sibling line was advanced as UC1361 to multi-location elite and regional testing from 2002-2004. UC1361 showed good yield potential and excellent breadmaking and noodle quality and was released as Clear White. One thousand headrows were planted in 2002 on the UC Davis Agronomy Farm and designated as Breeders Seed. A total of 9,000 lbs of Foundation seed was harvested at Imperial Valley in 2004.

### ADAPTATION

Clear White was tested from 2002 to 2004 under irrigation in multiple locations at the San Joaquin and Sacramento valleys and in several rainfed locations. Considering the average yields from 2002-2004 in Regional Trials, Clear White was the fifth highest yielding variety in the regional trials from the Sacramento and San Joaquin valleys (3<sup>rd</sup> among the white wheats).

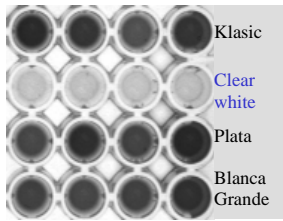
### PEST AND DISEASE RESISTANCE

Clear White has excellent resistance to prevalent races of leaf rust in the Sacramento and San Joaquin Valleys. It has partial resistance to Stripe Rust with some locations showing up to 15% area of the flag leaves infected. Clear White has better resistance to Septoria tritici blotch than Yecora Rojo but lower resistance than Blanca Grande. Clear White has adequate levels of resistance to Barley Yellow Dwarf Virus comparable to Blanca Grande and Plata.

## [AVERAGE YIELD DATA 2002-2004](#)

Considering the average of the last three years of the Regional Trials, Clear White has a 20% higher yield than Klasic and 12% lower yield than Blanca Grande. Complete data for yield and quality is available at [http://agronomy.ucdavis.edu/Dubcovsky/Breeding/Clear\\_White.pdf](http://agronomy.ucdavis.edu/Dubcovsky/Breeding/Clear_White.pdf).

## [QUALITY](#)



Clear White is currently the only hard white wheat in California with low levels of Polyphenol Oxidase Activity (PPO, see figure) and adequate color for Asian Noodles. It also has excellent backing characteristics (backing score 4.7 over 5) and it can be considered a dual purpose wheat. Clear White has high molecular weight glutenins that are optimal for breadmaking quality and intermediate values of grain protein content (average 12.4 %).

## [SEED CLASSES AND PRODUCTION](#)

Seed classes of Clear White are Breeder, Foundation, Registered and Certified. The University of California Foundation Seed Project, Davis maintains breeder and Foundation seed classes. Foundation, Registered and Certified seed production are each limited to 3-years. Seed production of Foundation, Registered and Certified classes is limited to California. A total of 9,000 lbs of Foundation seed is available for production of Registered and Certified seed.

## [INTELLECTUAL PROPERTY PROTECTIONS](#)

Clear White has been submitted for Plant Variety Protection, Title V (U.S. Patent Application Serial No. 200400244). Under this protection, Clear Whiter can only be sold in commercial seed channels as a class of certified seed.

## [ALLOCATION and LICENSING](#)

Foundation seed of Clear White is distributed by the University of California Foundation Seed Program to licensed brokers and seed houses **twice annually**, fall and spring. Off-cycle requests are considered on a case-by-case basis.

To obtain information and/or a license for Clear White contact the University of California, Davis Technology Transfer Center:

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and <http://ovcr.ucdavis.edu/TTC/ncd/ncd.cfm?caseno=2001-095>