**UCD Hard White ‘Patwin-515HP’ commercially available**

**Patwin-515HP** grain yield across 15 experiments was higher (126 lbs/ac) than the original Patwin-515.

**Patwin-515-HP** average yield was similar to Blanca Grande-515, but showed higher grain protein content.

**Patwin-515HP** carries the *GPC-B1* gene for high grain protein content. It remobilizes N from the leaves to the grain more efficiently.

**Patwin-515HP** showed an average grain protein content of **13.8%** (**1.1% higher** than Patwin-515 12.7%).

**Patwin-515HP** has excellent bread making quality.

**Patwin-515** and **Patwin-515HP** were the most grown HWS varieties in California (10,100 ac) followed by Blanca Grande 515 (8000 ac).

Commercial seed of **Patwin-515HP** and **Patwin-515** is available from Adams Grain
New UCD Hard Red Spring ‘UC-Central Red’ (UC1817)

- **UC-Central Red (UC1817)** outperformed Yurok in yield trials from 2015 to 2017.

- **UC-Central Red** average yields from the last three years were similar to Summit 515 and higher than WB Patron and Joaquin Oro.

- **UC-Central Red** has better quality than Yurok:
  - 4% higher grain protein content
  - 15% higher grain hardness
  - 4% higher absorption
  - 31% higher falling number
  - 31% higher gluten index
  - 94% and higher development time
  - 130% higher stability.

- **UC-Central Red** showed excellent brad-making quality in CWC and Millers Collaborators tests.

- **UC-Central Red** foundation seed will be available 2018.

**UC-Central Red is UCD best hard red wheat!**
UC low Cadmium durum ‘UC-Desert Gold’ (UC 1850)

- **UC-Desert Gold** is 97% identical to **Desert King**
- **Desert King** and **DK-HP** planted in **40%** of the 2018 durum acreage
- **UC-Desert Gold** has
  - 50% less cadmium than Desert King (**Cd** transporter **Cdu1**)
  - 16% more yellow pigment (2 genes for increased pigment)
  - Good color stability (deletion **Lpx-B1.1** that degrades pigments)
  - Improved gluten strength (**↑W**)
  - Same grain yield and resistance to lodging
  - Foundation seed available in 2018.

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**Cadmium content in the grain**

- **Low Cd**
- **High Cd**

**Yellow pigment in pasta**

- **Davis**: Desert King (*******), Desert Gold (****)
- **Kern**: Desert King (****), Desert Gold (*******)
- **Imperial**: Desert King (*******), Desert Gold (*******)

**Gluten strength (alveograph W)**

- **Davis**: Desert King (*****), Desert Gold (*******)
- **Kern**: Desert King (*****), Desert Gold (*******)
- **Imperial**: Desert King (*******), Desert Gold (*******)
New UCD High Resistant Starch varieties

2017 three UCD high resistant starch varieties were submitted for PVP
2018 Foundation seed will be available
Due to current patents on the SBEII gene these will be exclusive releases. Contact:
   – Lima Grain
   – Bay State Milling (BSM)

• **UC-Lassik-RS** (UC1836). HRS. **880-905 % ↑ in resistant starch**
  Relative to Lassik without the mutations:
  • **Agronomic traits**: yield ↓10%, grain protein ↑9%, height ↓5 cm, heading ↓2-5d.
  • **Quality**: bread weight ↑11% & volume ↓17%, water abs. ↑28%, hardness ↑11%.

• **UC-Patwin-RS** (UC1837). HWS (Yr5,Yr15,GPC). **1030-1100 % ↑ in resistant starch**
  Relative to Patwin-515HP without the mutations:
  • **Agronomic traits**: yield ↓12%, grain protein, = height, heading ↑ 5-6 d.
  • **Quality**: bread weight ↑16% & volume ↓36%, water abs. ↑35%, hardness ↑28%.

• **UC Desert King-RS** (UC1848). **940 % ↑ in resistant starch**
  Relative to Desert King without the mutations:
  • **Agronomic traits**: yield ↓14%, cd↓55%, grain protein ↑3%, height ↓3cm, heading ↑3-5 d.
  • **Quality**: pasta firmness ↑12%, falling number ↑36%, semolina color ↓2-3%, TW ↓4%.

Mutations in the SBEII gene increase amylose and resistant starch content in the starch

When blended with normal flour (50%) the effects on quality are smaller