

Cereals – Barley, Emmer, Oats, Rye, Spelt and Wheat



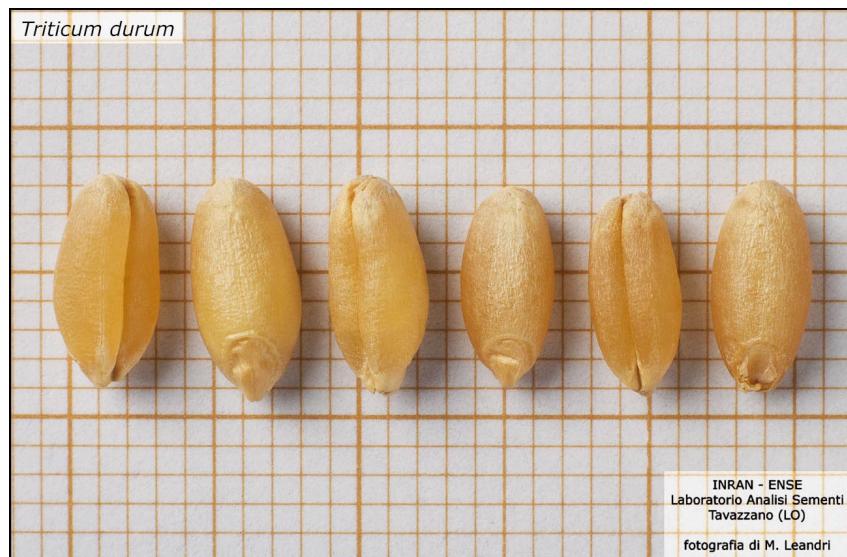
Wheat, Common *Triticum aestivum* L. Poaceae

Yellow-brown for soft wheat, brown for hard. Lemma is mostly absent. Palea is mostly absent. Embryo with rounded apex, deep groove on ventral side. Surface Texture Smooth with tuft of hair at apex. The caryopsis tends to be broadly obovate and the embryo has a rounded apex. A deep groove is found on the ventral side. The soft wheat are lighter and more opaque than the hard wheat.



**Durum Wheat *Triticum turgidum* L. subsp. *durum* (Desf.) Husn.
(=T. durum Desf.) Poaceae**

Light brown. Usually no lemma and palea. Caryopsis hard and semi translucent and its ventral crease is wide V-shaped. Surface Texture Glabrous with tuft of hair on apex. Seed Type Caryopsis. The endosperm is hard and translucent. Often the surface has flat surfaces with angular edges.



Triticale × Triticosecale spp. Poaceae

Cross between wheat (*Triticum*) and rye (*Secale*).



The grain of wheat, rye and triticale — triticale grain is significantly larger than that of wheat.



Rye *Secale cereale L. Poaceae*

Brown to metallic green. No lemma or palea. Pointed embryo one-third the caryopsis length. Surface Texture is rough and scaly. Seed Type Caryopsis. The caryopsis (grain) is pointed at the embryo and usually parallel sided from the embryo to the apex. The caryopsis is ridged on the embryo side and grooved on the other.



Oats *Avena sativa* L., *A. nuda* L. *Poaceae*

Yellow to light brown, depending on cultivar. Lemma encloses most of the floret. Palea enclosed by lemma. Weak awn sometimes present. Disarticulation by fracture. Surface Texture Smooth. Seed Type Floret. If awn is present, it is not well developed and the geniculation is below the tip of the lemma. Because disarticulation is by fracture, there is no well-developed callus. A terminal floret is sometimes enclosed within the lemma of a lower floret.



Oats Hulless *Avena nuda* L. *Poaceae*



Avena sativa



Barley *Hordeum vulgare L. subsp. vulgare* Poaceae

Light Brown. Lemma is widest in middle with straight line slope to ends; wrinkled where attached to caryopsis. Awn often broken off. Palea has enrolled margins and convex with deep groove in center. Awns mostly removed by conditioning. Rudimentary rachilla. Surface Texture is glabrous and wrinkled where attached to caryopsis. Seed Type Floret. Seldom is a free caryopsis found except in seldom used varieties called "hulless barley". The shape is unique by having straight sloping sides from the wide middle to the base and apex. Awns broken off.





Spelt *Triticum aestivum* L. subsp. *spelta* (L.) Thell. (*T. spelta* L.) Poaceae

Light Brown. Lemma and palea are not visible. Often in spikelet form with multiple florets and short glumes. Surface Texture Reticulate with a large tuft of hair at apex. This species is regularly found in spikelet form. The spikelet has multiple florets and glumes that are shorter than the lowest floret. The caryopsis has quite rough reticulations.





Triticum aestivum
ssp. spelta

Emmer *Triticum turgidum* L. subsp. *dicoccum* (Schrank ex Schübl.) Thell.

(=*T. diococcum* Schrank ex Schüb) **Poaceae**

Light brown spikelet. Brown caryopsis. Lemma is smooth and awn less. Palea is smooth. Florets longer than glumes. Surface Texture Smooth. Tip of caryopsis has a tuft of hair. The species is found as spikelets. The occasional caryopsis have high dorsal curve and the ventral side is curved inward. The spikelet usually contains two florets.



Triticum turgidum
ssp. *dicoccum*

