

Breeding for organic systems

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The organic oat industry, composed of growers, processors, and consumers, requires specialized cultivars developed for their unique production systems and needs. Organically-produced oat sells for a premium price and is in high demand by the milling oat industry and consumers. Organic oat breeding must consider many components, but can be generally grouped into agronomic, disease, and quality factors. Organic cultivars must have high yield under regional organic management and practices and use nutrients efficiently. Critical agronomic traits such as robust early growth, plant standability (lodging resistance), earlier maturity, and faster crop drydown are key concerns expressed by organic growers. Organic cultivars also require good genetic resistance to crown and stem rust, loose smut, and fusarium head blight because fungicide use is not an option in organic production. Sources of resistance are available for all of these diseases, but are a challenge to combine together. Another priority is retaining and/or improving the quality of organic products through increased nutritional value and optimizing beneficial soluble fibre (β -glucan) and protein content. Thus, organic oat cultivars must possess the best available disease resistance while retaining agronomic and milling performance. Development of new organic oat cultivars is best done by selecting breeding lines under organic or low-input conditions. Selecting in conditions found in organic production should continue to identify the best breeding material for future superior performance under those same or similar conditions. Development of new organic oat cultivars is critical to meet the growing consumer demand, but must have the genetics providing stable production across diverse environments and fit organic management systems.