



Science
Societies

New barley variety limits cancer risk in whiskey and bourbon

By Shea Topel

| February 25, 2025



Stakeholders survey a field of 'Top Shelf' barley in Chehalis, WA. Photo by Pat Hayes.

Plant breeders have created a new breed of barley, known as “Top Shelf,” that is completely free of a common carcinogen found in spirits. These chemicals, called glycosidic nitriles (GNs), can turn into the carcinogen ethyl carbamate during the usual distilling process used to make grain alcohol.

As one of only two varieties free of this risk, Top Shelf could make whiskey safer to drink and more enjoyable for all.

Top Shelf was tested against GN-free spring barley breeds to determine its quality. The variety met every specification and crushed its competition most of the time. It scored the highest yield six times and had the highest amount of protein seven times. In over five years of field trials, Top Shelf performed equal to or better than every other variety of malt tested. It has high yields and weight with huge grains to ensure a plentiful supply. Tests revealed an 80% resistance to leaf scald disease with heat and drought tolerance to boot.

Because Top Shelf is one of only two barley breeds immune to GN, it is crucial for the global supply chain and every spirits lover who might otherwise have to fear cancer risk. Recent industry regulations have been placed to ensure that barley malts don't produce glycosidic nitrile, the precursor to ethyl carbamate. When combined with heat and copper, it turns into cyanide and then into ethyl carbamate when it meets ethanol.

Ethyl carbamate is responsible for one of the largest mass exposures of humans to a carcinogen in history. It's been banned from medicines since the 1970s, but due to outdated processes, it can still appear in malt brewing.

While there are scientific methods to detect ethyl carbamate in food, there do not seem to be many warnings placed on food items, so consumers will be at serious risk unless brewers take charge to prevent its formation.

Additionally, Top Shelf is a dream come true for growers across the country, especially in the Pacific Northwest, Idaho, the Columbia Basin, and the Palouse, in Washington state. It's met every criterion and proven that its grains can grow large and healthy and that it works for all-malt and grain distilling. In an uncertain climate future, Top Shelf may weather the drought and fill the world of grain alcohol with a safer and tastier kind of malt.

Dig deeper

Read about Top Shelf in the *Journal of Plant Registrations* here:

Morrissy, C. P., Filichkin, T., Fisk, S. P., Helgersen, L., & Hayes, P. M. (2024).

Registration of 'Top Shelf' barley: The first glycosidic nitrile-null, winter malting cultivar to be released in North America. *Journal of Plant Registrations*, 18, 241–249.

<https://doi.org/10.1002/plr2.20366>

Text © . The authors. CC BY-NC-ND 4.0. Except where otherwise noted, images are subject to copyright. Any reuse without express permission from the copyright owner is prohibited.