

[Episode 54]

New Barley Variety “New Sachiho Golden” Produces a Beer that Retains Its Freshness Well

Outcome Example of Bio-oriented Technology Research Advancement Institution

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In response to the demands of beer brewers, who are the end-users of malting barley, a research group led by the Tochigi Agricultural Experiment Station has developed a new malting barley variety named “New Sachiho Golden,” that can be used to brew a beer that retains its flavor and aroma well. “New Sachiho Golden” was registered in 2018 and is currently cultivated in Tochigi, Shiga, and Kyoto Prefectures, with particularly widespread adoption in Tochigi, the leading producer of malting barley in Japan. As the cultivation of the variety continues to expand, it is expected to further promote the production of domestic malting barley that meets the needs of the brewers in terms of both quality and quantity.

What is New Sachiho Golden?

It is commonly understood that beer is in its best condition right after it was brewed. However, beer is usually consumed after a certain period has passed since its brewing, thus it is required to appropriately maintain its freshness. As the freshness deteriorates, beer starts to emit unpleasant odor as referred to as a cardboard smell. This is because an enzyme called lipoxygenase (LOX-1) contained in malting barleys promotes the production of trans-2-nonenal, which is said to be a cause of deterioration of the freshness. For this reason, beer brewers have strongly desired the development of a revolutionary high-quality barley variety that does not contain LOX-1 and can be used to brew beer with excellent flavor stability (retaining flavor and preventing unpleasant odors and decline in head retention of beer).

In order to develop such a new variety, the research group crossbred the “Daikei LM1”, a mutant barley lineage that does not contain LOX-1, with “Sachiho Golden”, the main malting barley variety in our country, and continuously backcrossed* “Sachiho Golden” with its hybrid descendants. As a result, they have developed “New Sachiho Golden”, which has, like “Sachiho Golden”, large grains and high-yielding characteristics, is also resistant to barley yellow mosaic virus (Types I to III), and does not contain LOX-1 that degrades the freshness of beer (Photo 1).

In a sensory test comparing beers made from “New Sachiho Golden” and “Sachiho Golden”, it was shown that, one month after their brewing, the off-flavors such as cardboard smell and bitterness are more suppressed in the beer from “New Sachiho Golden,” making it a well-balanced beer with a good aftertaste.

Another advantage of “New Sachiho Golden” is that its cultivation method is the same as “Sachiho Golden,” therefore it is easy for barley producers to cultivate and for the areas where “Sachiho Golden” has been cultivated to introduce. In Tochigi Prefecture, a manual summarizing the characteristics of the variety, the background of its development and

cultivation points has been developed for further promotion.



Photo 1: New Sachiho Golden in the full heading stage
(provided by Tochigi Agricultural Experiment Station)

New Sachiho Golden Adopted Widely in Tochigi, Shiga and Kyoto

Tochigi Prefecture is the number one producer of malting barley in Japan (for the harvest in 2022). In all the areas of the prefecture where malting barley is cultivated, “Sachiho Golden” has been replaced by “New Sachiho Golden.” This new variety has been also adopted for cultivation in Shiga and Kyoto Prefectures.

In Tochigi Prefecture, one of the beverage manufacturers has commercialized a beer that uses 100% “New Sachiho Golden” harvested in Utsunomiya area of the prefecture (see Photo 2). At the roadside station “Romantic Village” in the prefecture, you can tour a beer factory that uses “New Sachiho Golden” and experience sowing it. At the elementary school which a well-known popularizer of malting barley in the prefecture, Mr. Ritsunosuke Tamura, graduated from, children can experience and learn sowing, treading and harvesting the “New Sachiho Golden,” as well as its malting and beer brewing (see Photo 3).

End-users, or beer brewers, highly regard the variety, as “it excels in terms of germination speed and the dissolution of endosperm contents during malting, making it a problem-free variety,” and “its moisture and protein content remain stable every year, with no issues noted during its inspection upon receipt.” Barley producers also appreciate “New Sachiho Golden for its disease resistance, high quality, and early harvest time contributing to easier cultivation.

Barley producers who cultivate the New Sachiho Golden in Tochigi Prefecture have produced 100% of the volume contracted with the beer companies, which had been predetermined before the production of malting barley was carried out. This level of contract fulfillment rate is higher than the national average of 95% (for the harvest in FY2023).



Photo2: Products 100% made from New Sachiho Golden harvested in Utsunomiya
 Source: Japan Beer Journalists Association
 (<https://www.jbja.jp>)



Photo3: Craft beer “The Story on Ritsunosuke: Bakushu (barley harvest)”
 (provided by Farmers Forest Group)

Expectation for Growing Demand for Domestic Malting Barley

If the New Sachiho Golden becomes more widespread, it can meet the growing needs of consumers and end-users for premium beer, through the development of products that are more delicious and made from domestic ingredients. The increase in demand for such domestic malting barley would lead to the growth in its cultivation and production, with economic ripple effects on related industries such as beer manufacturing, its distribution and malt production, as well as on the producing farms.

*Continuous backcrossing: it refers to the process of crossing a hybrid offspring with one of its parents again.

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