

Since the audacious efforts of Japan Airlines to [transport fresh tuna from Canada](#) across the Pacific Ocean in the 1970s, the international sushi market has evolved to become as much a symbol of globalization as McDonald's or Starbucks. But one of the cuisine's key ingredients - wasabi - has been a slow-mover, at least as far as authenticity is concerned.



"Anything you get in a packet I can guarantee is only going to be about 0.5% wasabi at best because it's impossible to grate fresh and hold that flavor, because what you're eating is a chemical reaction and that flavor has a timeline," explains Nick Russell of U.K.-based The Wasabi Company.

Russell says the remaining 99.5% of your standard wasabi packet generally consists of horseradish, mustard, food coloring and preservatives.

And as fake wasabi has squeezed its way onto sushi plates worldwide, restaurant goers have largely missed out on the health benefits found in the real product, known as a wasabi rhizome which is the stem of the plant.

In this special feature, *Fresh Fruit Portal* speaks with growers in North America and the U.K. to hear their views on the capricious crop, the difference between traditional and modern growing methods, and where future opportunities may be found.

Real Wasabi co-founder Doug Lambrecht has sought to replicate wasabi growing practices as close to Japanese methods as possible on his 75-acre farm in Cullowhee Mountain, North Carolina. This means planting on the fringes of a natural stream and being patient with both

the crop and the environment that surrounds it.

"It's not uncommon for us to have plants for two to three years before we get any sizable rhizomes out of them," Lambrecht says.

"Other people are content to push their production with a lot of fertilizers and such, but we just don't do that. Our farm is in the process of getting certified organic so we are really focused on the nutrition of everything we produce.

"We've been chasing after this puck for 20 years. The farm has been in existence for about 15 years now and we started back around that time acquiring wasabi strains from around the world and testing them on our mountain farm."

He clarifies there aren't a lot of different wasabi varieties in existence with most rhizomes very closely related genetically.

"We've had some success. The mountain likes wasabi, the wasabi likes the mountain," he says.

"We're at about 3,500ft elevation and we are growing wasabi in the traditional Japanese way, which is referred to as Sawa wasabi, grown in natural water.

"We're primarily focused on the plants because there was such a void in the marketplace, and we can fulfill that niche."

He says sales are mostly to domestic farmers and home gardeners, along with shipments of wasabi powder overseas.

Development of the business hasn't been easy though, wrought with long timeframes and sensitivity to inclement weather.

"I've always cautioned people it's not a get rich quick scheme. It's a get poor slow scheme. It's not a big moneymaker - this is a very difficult plant to raise and if you do it the traditional way it takes a long time," he says.

"Part of it is, we're in a natural environment. We've had harsh, late spring freezes, we've had bears wallow in the mud of a wasabi field and just crushed the plants, and they're very brittle plants so that was not much fun.

"We've lost some, but most of them manage. If you get a 2ft high flood surge which can

happen around here, it'll bend them over, sometimes bust a few stems but usually they'll stay rooted and stay in place. And they're fairly resilient to coming back."

On the North Carolina property, he says the wasabi plants start to flower in mid-February.

"They're green and flowering before anything else is even showing leaves," he says.

"We haven't had many disease incidences in the natural stream - in fact that's one of the reasons we bias ourselves towards that is it's very pure spring water and the wasabi grows slowly but it stays healthy."

Pacific Coast Wasabi: Faster turnaround with a new approach to production

Lambrecht's growing methods are in stark contrast to Pacific Coast Wasabi, a Canadian company that is one of the leaders in wasabi production in the New World with greenhouses in British Columbia, Washington State and Oregon.

That's right - greenhouses, not mountain streams.

"We grow in hydroponics but it's completely different to the standard hydroponics that people would think. We grow in greenhouses, and the Japanese for the longest time have said you can't grow in greenhouses," says president Brian Oates, who is based just outside Vancouver.

"In that system we're able to feed all the appropriate nutrients and take care of all the 'green meanies', let's call it. We have over the years developed a very specific fertilizer mix for the wasabi and that is key to growing it."



Pacific Coast Wasabi's greenhouses on Malcolm Island, British Columbia.

Since Oates received the first wasabi plants from Japan and started tinkering with different production techniques, the emphasis has always been on striving for the highest product standard.

"The bottom line is after many years you're producing wasabi of a quality that matches the top quality of the Japanese," he says.

For most wasabi operations the first crop is ready two years after planting, but through its techniques Pacific Coast has been able to cut that down to 15 months.

"And once we start harvesting we're harvesting continually - weekly, daily, whatever the customers need," he says.

But if the rhizome is left in the water, does it lose shelf life?

"Basically it just gets bigger and more valuable, at least up to a point," Oates replies.

While harvesting lag times may make wasabi cultivation a "get poor slow scheme" as Lambrecht describes, the end product is nonetheless highly valuable. Oates says his rhizomes sell for around CAD220/kg, and incidentally US\$220/kg as prices were set when both currencies were close to par and Oates wants stable pricing in order to better develop markets.

"I'd say about 90% goes into the wholesale market. We export to Europe and of course we sell in Canada and the U.S. We have samples on their way to China and Hong Kong, and there's interest in Japan but we're not selling there yet," he says.

"The Japanese don't think anybody else can grow it to the same quality. The issue is that we might be able to sell it in Japan but not for our price, so we're waiting.

"The market opportunities here and elsewhere are big enough that we will get to Japan when we need to."

Oates believes his wasabi standard is at the same level as in Japan, but what are the determining factors that define 'quality' in this crop?

"It's heat, flavor, color and paste quality. When you make it up what does the paste look like? What's the texture like?"

"The texture of course is dependent on the



The interior of one of Pacific Coast Wasabi's Malcolm Island greenhouses.

quality of your grater so you need good quality graters - the Japanese talk about shark skin, but because the technology changes it's slowly being edged out by things like very good quality ceramic graters."

Culinary "just the tip of the iceberg"

Oates says his mandate is to not overproduce, but the company is in an ideal situation now with the option to freeze-dry wasabi as well, opening up more opportunities within the food industry as well as in health supplements.

"The markets go beyond culinary - culinary is just the tip of the iceberg and it's the biomedical that is by far the reason we're doing this," he says, clarifying that the food market "will always be there".

"It's known as an anti-cancer agent, anti-inflammation, and anti-allergies is probably where we get the strongest positive results," he says, citing scientific articles from Japan that point to these and other conditions such as blood thinning and gastrointestinal issues.

"Another exciting area is the vanity market and by that I mean cosmetics," he says, claiming wasabi helps get rid of wrinkles and can even cure baldness.

"We have several people in North America who tried it and got positive results - people getting new hair. The other thing on the hair story, it will or does get your natural hair color back. So you can imagine the opportunities there," he claims.

In 2007, Oates co-authored a phytomedical review of *wasabia japonica* in *Naturopathic Doctor News & Review*, highlighting wasabi's higher concentrations of bioactive isothiocyanates (ICTs) compared to other plants in the mustard family.

"There is a tremendous amount of ongoing research, especially in Asian countries, on *Wasabia* and its medicinal benefits," Oates and co-author Glen Nagel wrote.

"Current findings center on ITCs that provide the majority of activity. Many scientists have focused on 6-MITC, of which *Wasabia japonica* contains a high concentration."

The authors noted wasabi's ITC can have an inhibiting effect on enzymes involved in inflammation, bacteria, yeast, mold and platelet aggregation, the latter an important

property for protection against heart attacks and strokes.

The health benefits of wasabi are also a great motivator for Nick Russell of the Wasabi Company, which has stream-fed plantings in the southern English counties of Hampshire and Dorset.

"The massive difference in there for me personally is the medical benefits you get from the fresh product," Russell says.

"There's a reason the Japanese have been cultivating it since 1600 BC - originally for its ability to combat food poisoning, hence its pairing with raw fish.

"It's an anti-inflammatory, its antioxidant, anti-bacterial, and one of the byproducts of the chemical reaction is it creates something called isothiocyanates (ITCs) and they indirectly can interrupt the blood supply to cancer cells. So as a superfood it's way up there."

Production in the U.K.

Wasabi cultivation in Europe may not be as advanced as in North America, but groups like The Wasabi Company in England and Wasabi Crop Limited in Northern Ireland are help putting the crop on the map.

"We grow in the river system in old converted water rest beds, and because of the way the farm is set up certain parts of the farm are more productive than others," says Russell, whose company has traditionally been involved in watercress.



"That allows us to plant a couple of times a year in two big pushes, and that in turn allows us to harvest throughout the year because of the varying productivity of the beds."

Like Lambrecht in North Carolina, Russell says it takes a patient farmer to grow wasabi.

"Commercially it's one of the hardest crops in the world to grow. Although it's a very hardy plant, its behavior is sometimes very hard to plot or react to, and with it being a two-year lifecycle, any trials you're going to run or, any data you're going to collect, it's two-year wait. So it's long-term," he explains.

"It is an expensive product but it always has been. It's always been known to be reserved for the ruling classes - certainly in Japan it was very much for the elite.

"And the price does reflect that in a way. In the U.K. we're selling this at £250 a kilo."

He says the growth in popularity of Asian cuisine is helping to drive demand, and there is "definitely a retail market".

"It's going to be finding its way into a lot more homes," he says.

"For us it's chefs and distributors around Europe. We're lucky enough to work with some of the best chefs in the U.K.

"It's not just Japanese cuisine either. We sell to Gordon Ramsay's Pétrus, and that's about as French as it gets."

The Wasabi Company is a supplier to Netherlands-based East4Fresh, which has invested heavily in preparing retail solutions for wasabi and other Asian vegetables in continental Europe. The company's 'Wasabi Gift Box' was a contender for this year's Fruit Logistica Innovation Award.

"We developed with the supermarkets in Germany and now the package is nice with a good story of untreated wood and so on, but we will develop a cheaper one because it's too much packaging for the product," says representative Helien Verhagen.

"It's about getting a wider, bigger platform because we are a niche market and in a niche market it's already difficult to sell the product," she says.

"We have have sold some to Portugal but you need to have a high-class supermarket which will sell it in the metropolitan cities more or less like Frankfurt, Berlin, Hannover, cities like

that."

Ironically, she adds it is very difficult to import wasabi from Japan for European retail, and it's a similar story with China for sourcing Chinese vegetables.



"Japan is not accredited with the right certificates to serve supermarkets in Europe...They don't use the GlobalG.A.P. system that we use in Europe.

"That's why we only work with growers in Europe and try to develop that."

Last year our sister publication *Produce Business UK* ran a [story on Wasabi Crop Limited](#), a group in Northern Ireland that has experimented with new growing techniques for the traditional crop.

Dr. Sean Kitson says the group, in partnership with vegetable grower Gilfresh, has the wasabi planted in a 1.7-acre greenhouse.

"We haven't got 1.7 acres full of wasabi rhizomes, but that's the potential it could go to," he says, clarifying the plants occupy around 5-10% of the greenhouse space.

"We've gone from the experimental stage from the polytunnels we've got. We've transferred to a greenhouse glasshouse and we're doing some experiments now.

"We should have our first rhizomes harvested round about June this year."

He says the biggest challenge has been making the switch from polytunnels to the glasshouse.

"We haven't really got streams [like in Japan] so we can't adopt that model, but we've adopted a new model where we could also adopt the streams model simulation through hydroponics," he says.

"We haven't got to hydroponics yet but that's something to bear in mind for the future. We've tried a number of things - drip irrigation and overhead irrigation. We have a mixture in our experiments."

We ask Kitson whether the first steps after the June harvest will be finding sales in the U.K., and perhaps further afield in continental Europe.

"We're interested in places like that but what our marketing strategy is that we haven't marketed too much. The website does that already, and we have to get our side right before we market it properly.

"It takes two years to grow...It does take time to develop and know the ins and outs of what we're dealing with."

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