

What to grow in hydroponics ? Part 3

Wasabi japonica

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We came across wasabi japonica just by chance. Wasabi is this green “mustard” which is generally served in Japanese restaurants with sashimi and sushi.

My husband William and I love sushi, and I am a real fanatic of gari (pickled ginger) and wasabi (Japanese mustard). Any time travelling, I try at least one sushi bar. The best ones were in Vancouver Island and San Francisco. And just now, last November, I had the chance of tasting them in Tokyo itself... Fresh, exquisite, and always so beautifully presented! But then I heard that the “wasabi” we thought we ate was in reality a mix of horseradish, mustard and colouring! So what about the real thing, wasabi japonica? That’s when I did my research and found out all about this amazing plant.



Wasabi is a very delicate plant, which traditionally grows wild in the mountains of Japan. It is used since very ancient times for its medicinal properties, especially its anti-bacterial action. It is also used as one of the main spices in the Japanese cuisine. Today it is still cultivated, mainly in the prefectures of Nagano, Iwate, Shimane, and of course, in the Izu Peninsula in Shizuoka prefecture. Due to an increasing demand worldwide, it is now also cultivated in Australia, New Zealand, and on the Pacific Coast of the USA and Canada.



Wasabi japonica is a slow growing, small (+/- 40 cm high) perennial from the Brassicaceae (cabbage) family, with heart-shaped, bright green leaves, long white stems, and a thick 10 – 15 cm long rhizome, which is the part most sought after. It blooms in the spring with very graceful little white flowers, and propagates either by seeds, or with offshoots that generally grow with the mother

plant. Today some use micro propagation, especially in Australia, although the Japanese growers are now using it too.

Wasabi has a very definite “hot and sweet” pungency to it, which ma-

kes it a unique spice. It owes this pungency to several isothiocyanates, a series of compounds that give it its taste as well as its therapeutic properties. On the plant's level, they basically act as protectors, deterring pests and defending it against predators and disease.

There are two kinds of wasabi, "sawa-wasabi", and "hatake-wasabi". Sawa-wasabi is grown in cool mountain streams, and hatake-wasabi grows in damp and shady fields. Connoisseurs would tell you that the best is sawa-wasabi, hotter and tastier. And this is what the market is looking for. To grow well, wasabi in general, and particularly sawa-wasabi, needs an air temperature between 8 and 20°C, and prefers humidity in the summer. Sawa-wasabi needs to grow in pure cool water, at a temperature ideally between 13 and 19°C. It needs shade, and very little nutrients, with just the right mineral balance. As long as these conditions are met, and the roots remain in a well-oxygenated, fresh flow of water, it is happy.



Growing sawa-wasabi is a difficult job. Fields are built along mountain streams. They are generally located in deep misty valleys, where the water is diverted into a long line of narrow terraces. It takes 1,5 to 2 years to grow a mature rhizome, ready for sale. Fields are harvested and replanted chronologically, in order of maturity. When the mother reaches the proper size and the rhizome is ripe, the grower pulls it out and separates the rhizomes from the seedlings. Those same seedlings will be replanted to give the next crop. It is very arduous to reach those fields, not to talk about working bent in two every

day, with hands and feet in the cold water. Less and less people want to do the job, and today an increasing number of Japanese farmers are growing hatake-wasabi, faster (1 year crops) and easier to manage. If it wasn't for some passionate growers - and the increasing demand for the product - the traditional sawa-wasabi would have disappeared to the benefit of hatake-wasabi, or it would be slowly replaced by the "wasabi" we know, the green mixture of horseradish, mustard and colouring...



Demand for the green paste is growing fast, as Japanese restaurants flourish all

over the planet. Besides its culinary use, *Wasabi japonica* is known as a medicinal, especially for its ability to fight food intoxication. Nowadays researchers are discovering that it has several other medicinal properties. The same isothiocyanates that give it its pungency are the active principles that help cure quite an impressive list of diseases. They seem to act as:

∑ Anti-Cancer and Anti-Oxidant (mainly breast, prostate, colon, lung, leukaemia, pancreas, oesophagus, bladder).

∑ Antibiotic (general infections, oral hygiene, cavity prevention and ulcers).

∑ Anti-Coagulant (blood thinning for circulation and prevention of strokes, treatment of atherosclerosis).

∑ Anti-Inflammatory: asthma, arthritis, allergies, anaphylaxis - aids in the healing process

∑ Aids in bone calcification (fights/prevents osteoporosis)

(See www.wasabia.com/science-biomedical.php)

Due to its numerous qualities, and its economical value, more studies are launched in the medicinal as well as in other fields, especially in the cosmetic industry for instance, to fight skin disease.



A New Zealand study shows that today one test growing Waikato wasabi showed a yield of 3t/ha of stems ready to export, with a total yield of 17t/ha. www.crop.cri.nz. The rest of the crop is totally processed in Japan, including small offshoots and leaves. Fresh wasabi is very highly priced in Japan and worldwide, and the demand is increasing so rapidly, that you c

an't find as much of the product as is necessary. This is why you find lots of the horseradish and mustard mixture so commonly.

Wasabi japonica naturally went on my list of plants qualifying for hydroponics cultivation: it is arduous to grow outdoors, it has numerous medicinal and industrial applications, it is in increasing demand worldwide, and it is a high value crop. So I ordered fresh plants from Japan through my distributor, Zou no Tamago, who got them directly from a reliable source. Upon reception we immediately planted them in a Dutch Pot Hydro, and fed them with Flora Series in the ratio of 3 FloraGro, 2 FloraMicro, and 1 Flora-



Bloom. As we had little information about growing them, we decided on an EC of 1,5 and a pH of 6,5. It was the summer of 2007, and it was quite hot here in the South-West of France. But the plants, although a little slow, established well and started growing. On very hot days, we could see them slightly wilt and strain to survive. But



as soon as it was cooler they would revive and resume growth. It was a pleasure to see the first leaves sprout, then the whole plant develop. When we saw the first flowers we thought we had a victory, and although we noticed that growth was slightly strenuous, we still planned on our first crop for end 2008, or spring 2009. Unfortunately we didn't get the results we were hoping for. In the fall of 2008 our wasabi plants started to show signs of weakness. Then some damping off developed at the base of the stems and the plants looked miserable. After a few days we saw



little dark worms crawling and damaging the rhizomes. We tried to save them. We dipped all remaining healthy plants into a barrel of water with Mineral Magic. Water to drown the worms, Mineral Magic to help fight the rot. But it was too late, and the plants were too weak at that time. In a few days we lost our crop!

At that time we didn't know which were the reasons for this failure. In November 2008 we had to travel to Japan, so we planned a visit to a wasabi operation. We were directed to the Izu Peninsula, the traditional region of wasabi growers. We visited the well-known Asada Masataka farm, growing Mazuma sawa-wasabi, the best variety there is. To get to the fields we had to walk uphill along a lively mountain stream with mud and water dripping everywhere. After a while, we discovered long rows of green terraces covered with wasabi plants at all stages of growth. We were shown how plants grow, what they need, the way they are separated and replanted, the way they are managed. We were quite lucky to be introduced to the Masataka farm.





In Japan, each farmer has his own secret know-how, and it is not about to be revealed to the main public, although you can now find grower's advice all over the internet. This visit was highly informative for us, and revealed the main reasons why our venture was totally unsuccessful! ... Our climatic circumstances were far from being adequate. We grew wasabi in spite of all basic requirements

and it is even a miracle we got so far! In fact it is partly because hydroponics offer a particularly well-adapted environment to wasabi, and our nutrients are pure and provide the perfect nutritive balance for this delicate crop.

Upon our return, we are now ready to experiment some more until we make it, knowing that the main conditions to a successful venture is to keep the right water and air temperatures, and provide a balanced nutrition (low EC, no or very little calcium) to our plants. There is much more to it than that of course. It will be interesting to continue our tests until total success. It always was our pleasure to grow and experiment on plants and study their potential success in hydroponics. Nowadays, as demand is growing and economical interests are met, there are several successful hydroponics operations growing wasabi, mainly in Australia, New Zealand, and on the Pacific Coast of North America. (see www.wasabia.com, www.cityfarmer.org/wasabi.html, www.dpiw.tas.gov.au, www.skillsone.com.au, and many more). These are huge greenhouses with perfect climate control, and lots of means. It is not always necessary to run huge surfaces. We specialize in "family-farms", small or medium size operations for local markets. In today's world, hydroponics offer numerous applications, and in the midst of this huge economical turmoil we are facing, it may open much needed opportunities to any dedicated grower and entrepreneurial person.