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Taifun Soy Info

Technical information for soybean producers and processors

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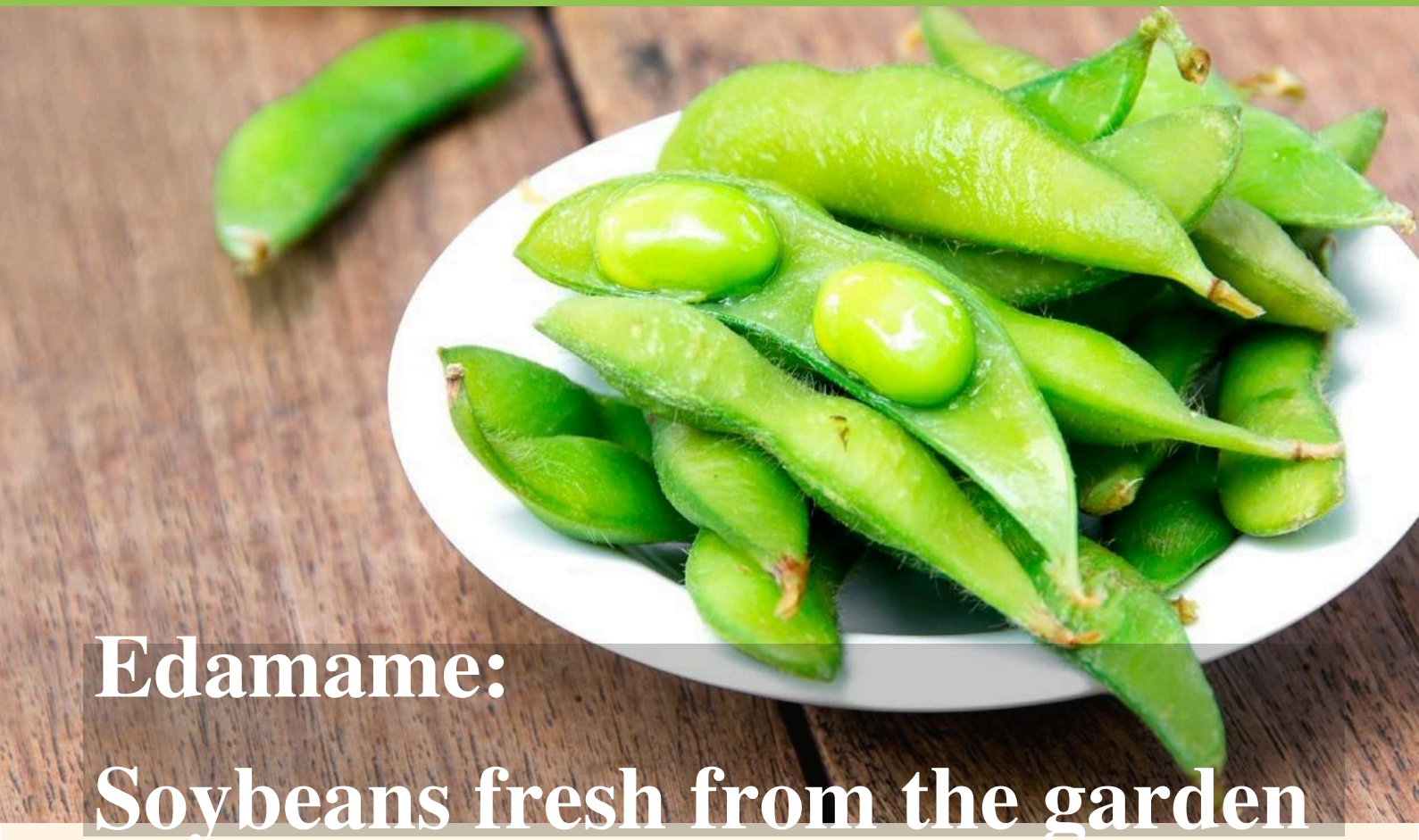


Edamame:
Soybeans fresh from the garden

For centuries, soy was used exclusively for direct human nutrition. Tofu, miso, tempeh, natto and many other traditional soy dishes form an elementary part of far-eastern cuisine. Another particularly healthy and tasty soy dish is edamame: green soy pods, freshly harvested and briefly cooked in salt water.

Edamame is served as a snack in the pod with a cold drink or used in various recipes as a fresh bean vegetable in the kitchen. Known in the USA for some time, green soybeans are also becoming increasingly popular in this country. Up to now, demand has been met mainly with frozen goods from China and Taiwan. The potential for cultivation in Germany is great, but cultivation is still in its infancy.

Use

Unlike bush bean (common bean) or pea, edamame is often served lightly salted as a snack without any other garnish. The seeds are extracted and the pods are not eaten. Shelled edamame beans can be used in many dishes such as salads or vegetable stir-fries.

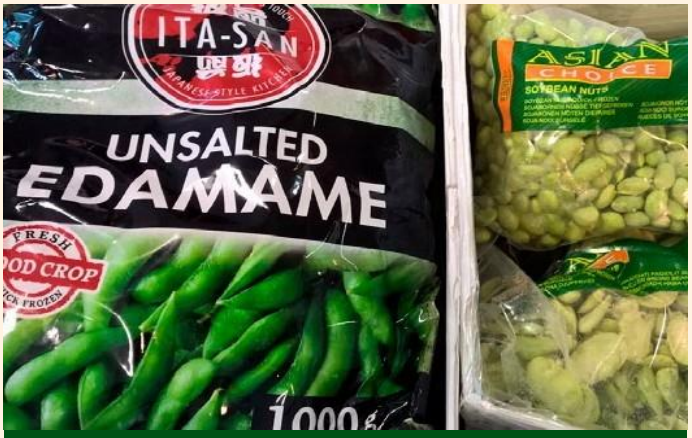
As expected, freshly harvested pods naturally taste better than frozen pods. However, due to the short harvest window, fresh produce is only available for a few weeks in midsummer. Alternatively, the beans can also be boiled or frozen. In addition, ripe, dry edamame beans are available roasted in different flavours. They taste different to the fresh green bean.

Plain and simple: Edamame is classically served as a fresh snack with cool beer.

Besides the excellent taste, edamame is popular because of the valuable ingredients. Hardly any other vegetable contains 12-13% protein of such high value as fresh edamame soybeans.

Cooked, shelled edamame beans can be used to make delicious rich creams. As with avocado cream, chives, coriander, parsley and other fresh garden herbs, good oil, onions, garlic and chilli go well with it.

Edamame is also available as dehulled frozen product for the kitchen.



Even beyond the Asian market, frozen edamame is now available in many supermarkets - but is often of mediocre

The general principles of soybean cultivation are described in detail on www.sojafoerderring.de. In the following, we give a rough overview of the special features that need to be taken into account when growing edamame as opposed to threshed soybean. Topics such as the correct sowing and harvesting techniques are only of importance in commercial cultivation, since in the home garden many tasks can be done by hand.

Edamame is a beautiful, hardy crop for the vegetable garden.

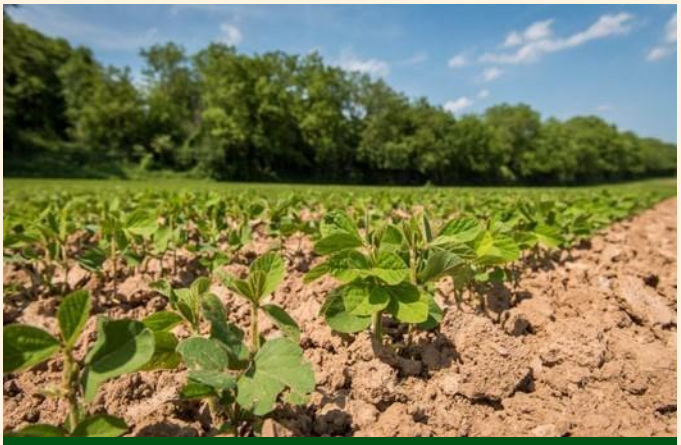
Site requirements

Due to the early harvest when the grains are still soft, edamame has a significantly shorter growing season than threshed soy. In addition, several varieties originate from the north of Japan and can therefore cope well in the cool German climate. Nevertheless, soybeans are basically heat-loving. Especially in the critical germination phase, a cold snap can impair development. If you wait until the soil warms up properly for the first time in May and the weather is stable, you can grow vegetable soybeans even in northern Germany.

Longer dry phases are well tolerated when the crop is young. A good supply of water is needed from flowering, in order to form yield and large grains. If the water supply is assured, edamame also thrives on very light sandy sites; soil and nutrient requirements are low.

Sowing and inoculation

Conventional soybean for the production of food or feed is cultivated on a large scale and threshed like cereals, rapeseed or faba bean when ripe. Edamame, on the other hand, is grown as a vegetable crop. It is sown in wide rows with a seed rate of 30-35 seeds/m^2 in order to obtain larger pods and grains. Common soybean is sown in the rule with 60-70 seeds/m^2. Due to the demanding propagation, edamame seeds are considerably more expensive than ordinary soy seeds.



To promote particularly large pods, edamame is sown with large distance between the plants.

Edamame soy varieties often have less vigour than conventional soy varieties. Therefore, even more attention must be paid to seed quality and optimal weather and soil preparation for sowing than is the case with regular soybean cultivation. Due to the early harvest at dough ripeness, a very late sowing into the warm month of June is possible. The seedlings appreciate the warmth of early summer very much.

Especially on heavy, cold soils, the rule is: Sow as shallow as possible, and only as deep as necessary to get enough germination water for the large grains. With a 1,000-grain weight of up to 400 g, edamame seeds are considerably larger than ordinary soybeans. In addition, depending on the seed lot, variation in seed size can be a challenge in single-grain machine seeding.

Large seeds with low sprouting power: Despite the same sowing date, the three rows of edamame are less developed than the tofu soy varieties on the right and left in the picture.

In principle, seed inoculation with rhizobacteria increases soybean yield and protein content, especially because the bacteria specific to soybean are not yet present in our soils. However, cultivation without inoculation is quite possible if the focus is not on maximum yield. Due to the early harvest, edamame has a lower nitrogen requirement than threshed soy. In addition, vegetable gardens generally have a considerably higher nitrogen level than fields.

Weed control

Due to the low shoot vigour and low seed density, the weed pressure on edamame is even higher than on ordinary soybeans. However, the considerably higher value added on a smaller area permits greater effort in mechanical control, if necessary also by hand. When using the harrow, it should be noted that the seedlings are more sensitive than other soybean varieties.

Pests and diseases

By extension, edamame is a robust vegetable. As with grain soybeans, there are hardly any diseases or pests that would require plant protection. Due to the reduced plant density and the harvesting before maturity, diaporthe and sclerotinia fungi, which otherwise occasionally damage grain soy, are not a risk. In principle, only the germination phase is critical. If it lasts too long, bean flies, pigeons and fungal infections can cause serious damage. Rabbits and deer also love the young, protein-rich soybean plants.

Harvest

Depending on the variety, harvesting takes place around 80 days after sowing, i.e. usually from August to September. The timing is crucial for the quality of the product. If harvested too early, seed size and consistency are lacking. If the crop is harvested too late, a "potato taste" develops due to the accumulation of starch, at the expense of sugar. In addition, the pods lose their strong green colour as ripening progresses. Even in the case of imported frozen goods, there are occasionally batches which have lost their sweetness and colour because they were harvested too late. Harvesting takes place when the first leaves begin to turn yellow. The pods must still be fully green, the seeds have not yet reached their maximum size.

Taifun employees help themselves in the test field. Self-harvesting is a good way to get edamame fresh from the field.

As a short-day crop, the harvest time of soybeans can only be controlled to a limited extent by staggered sowing. However, the harvest window can be extended from one to several weeks by selecting varieties that progress to maturity at different speeds.

Traditionally, the foliage is removed for harvesting; the remaining stalks, lush with pods, are bundled together so that the pods stay fresh for longer. Hence the Japanese word "edamame", which means "bean on a stick".

Due to the relatively light, individually hanging pods, hand harvesting is less productive than with bush beans, for example - one reason for the higher market price. In commercial cultivation, modified bean harvesters are often used.

Traditionally, edamame is marketed bundled without leaves on the stalk. This way, the pods stay fresh longer, even without a refrigerator. Photo: ProVeg

In addition to the optimal stage of maturity, top quality is characterized by pods with 3-4 grains as large as possible. Smaller pods are B-goods.

Special features of edamame cultivation at a glance	
Location claims	Due to early harvest, cultivation is possible also in cooler regions
Sowing	• Significantly lower sowing rate • Basically precision seeding (or hand sowing in the allotment garden) • Good weather forecast and soil warming even more important than for threshed soybeans due to low shoot vigour and sowing strength • Very late sowing possible and with cold spring recommended
Inoculation	Recommended, but due to the early harvest and due to the usually high fertiliser level in the garden not indispensable
Weed regulation	Due to sensitive seedlings, low seed rate and germination vigour still more demanding than for other soybeans
Diseases	Due to low plant density and early harvest even less fungal pressure
Harvest	Vegetable harvest at dough ripe stage, similar to garden beans

Variety choice

In principle, any soybean can be used as edamame by harvesting the green pods at dough maturity. For true enjoyment, however, special edamame soybean varieties with large grains, little pod wall hair and a delicate taste should be cultivated.

Top Seeds of the tofu variety Primus with relatively large grains. Below, the edamame varieties "Midori Giant" and "Green Shell" with significantly larger grains. The latter also remains green, a sign of delayed conversion of sugar to starch.

Even large-grain tofu soybean varieties selected for taste fall far behind good edamame varieties when it comes to consumption of the green pods. This can be confirmed time and again by a quick test among friends: While "real" edamame is eaten quickly, there is no real enthusiasm for other varieties after the first interest.

Some edamame varieties have black or even brown grains. The taste is also special with these varieties.

In the Far East, especially in China and Japan, there is a wide range of special edamame soy varieties. In commercial cultivation, high-yielding varieties are used, where many pods are harvested at the same time with mechanical harvesting. In hobby cultivation with manual harvesting, the opposite may be desired: continuous ripening over a longer period of time. Some varieties have black or brown grains. To extend the harvest window, there are varieties with different ripening phases. In our latitudes, varieties which are ready for harvesting in 70 to 90 days are suitable. In the tropics and subtropics, significantly later varieties with stronger branching are also cultivated.

What distinguishes edamame soy varieties?	
Taste	Edamame is supposed to taste sweet and fresh, not doughy and musty. Due to the high protein content good varieties are particularly full-bodied.
Sweet phase	The harvest window is quite short due to the conversion of sugar to starch. Accordingly, delayed starch formation is an important breeding objective.
Grain size	Edamame soybeans have one and a half to twice as large grains like conventional varieties.
Grains per pod	Pods with only 2 grains are B-product, so edamame is selected for pod size.
Pubescence	The weak hairiness serves the good mouthfeel when extracting the seeds.
Pod rigidity	As with pea, the pods of good edamame varieties open easily.
Colour	Pods and beans should be uniformly strong green. Some edamame varieties have black or brown grains.
Maturity	For mechanical harvesting, determinate varieties are used in which many pods are ready for harvesting at the same time. In the hobby garden, on the other hand, an extensive harvest window is advantageous.
Maturity date	There are varieties with very diverse ripening times, which considerably extends the otherwise very short harvest window.

Regarding the large diversity, it is not surprising that the varieties produce very different results under German conditions. So far there has been no official variety trial, but various pioneers have tested diverse varieties on their own in recent years - admittedly without publishing the results. It is clear, however, that among the Japanese varieties several are well suited for cultivation under German conditions.

In addition to the suitability of the variety, there is always the question of availability. Most varieties belong to Japanese breeding companies; in their own experience, these are generally not interested in propagation abroad. In North America, edamame seed is already being propagated on a considerable scale due to the high demand. Seed imports from Asia or America are expensive, and often the worst qualities are exported.

Local production - what works?

Individual pioneers have been showing the potential of edamame production in Europe for years. Various research institutes have already played with the new crop, but without carrying out official published trials. Compared to North America, the cultivation of the legume in this country is still in its infancy. The following are some current edamame projects:

- For several years, Ardo has had edamame produced under contract for frozen goods in Lower Austria. The products are sold in several European countries via the food trade. Currently, around 150 hectares are cultivated, part of which is organic: ardo.com/en/product/edamame-soy-beans-mukimame

- In Italy, Orogel has a similar project in the Po Valley: https://www.orogel.it/prodotti/verdure/vegetali/soia_edamame

- Probios produces canned organic peeled edamame in Italy: probios.it/prodotto/2026/soia-edama- me-italiana-fresca/

- In Switzerland, edamame pioneer Klaus Böhler has been producing certified organic edamame for some years now, with his own online shop for frozen pods and beans: klausboehler.ch/edamame

- In cooperation with Klaus Böhler, Pro-Verda-AG is currently raising Swiss production to a higher level. Both organic and conventional products are marketed in the form of frozen pods or grains: proverda.ch Sales take place via Migros, among others: community.migros.ch/m/Hinter-den-Kulissen/Schweizer-Edamame-ab-Herbst-in-der-Migros/ba-p/452729

- The author is currently constructing a domestic Edamame seed production at: gartensoja.de

Field cultivation of edamame for frozen goods in Austria

Conclusion

Whether on a large scale with its own freezing plant, as an enrichment for the weekly market and vegetable box or as a delicious source of proteins from your own garden: Edamame is coming. With the increasing popularity of edamame in Europe, the number of producers is also growing. The well-founded knowledge of regular soybean cultivation in Germany that has been acquired in recent years makes it much easier to get started in the cultivation of edamame when it comes to details such as the right inoculant or optimum irrigation. Some good edamame varieties are traditionally grown in cooler regions of Japan and are therefore optimally adapted to our climate. It is only a matter of time before fresh edamame becomes as well known in Europe as it is in America. There, the fresh pods are already among the most popular soy dishes.

Links

- If you type "edamame" into the search on this page, you'll find a wealth of English-language texts and books on the subject: www.soyinfocenter.com

- Detailed brochure from Washington State University on edamame production: https://pubs.extension.wsu.edu/download/sample/3551

- Press report on edamame production on a grand scale in Arkansas (English): http://www.arkansasonline.com/news/2012/nov/18/mulberry-processing-plant-set-be-edamame--20121118/

For comprehensive information on all aspects of soy cultivation visit:

www.sojafoerderring.de

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