seaberries

SEA BUCKTHORN

Seaberries (*Hippophae rhamnoides*) are shrubs native to Eurasia. They are most common in the semi-arid steppes that stretch from northern China through Russia. In Europe, they are primarily found in sand dunes near the ocean, hence their common name in English. Since 2000, they have primarily been sold under the name seaberry instead of sea buckthorn, to distinguish them from the distantly related common buckthorn, which is an undesirable invasive species in the deciduous forests of eastern North America.

Seaberry shrubs grow from eight to 30 feet tall, depending on the soil and cultivar. The leaves are small and slender with a silvery sheen. Fruit vary from yellow to light red, with most cultivars being orange. The plants have small, sharp thorns that are often hidden in the foliage. The species has two highly unusual traits that distinguish it from other species that produce edible fruit. First, the plant has the ability to fix nitrogen through symbiotic bacteria that live in its roots, which is a common trait among plants of the family Eleagnaceae. Second, the flowers are wind pollinated. The ability to fix nitrogen has made the seaberry a desirable plant for reclamation projects on the Canadian prairies. Like many wind pollinated plants, seaberries have small inconspicuous flowers and the male and female flowers are found on separate plants.

Seaberries are extremely cold tolerant. Many varieties are able to survive temperatures lower than -40°F. The flowers are likewise frost tolerant, which is common in wind pollinated flowers. Native to semi-arid climates, the plants are tolerant of both high pH and clay soils, with reports of some plants growing in soils with a pH as high as 8.5.

Figure 39. *Seaberry*

Figure 40. *Seaberries*

HISTORY

Seaberries have been used by humans for thousands of years. The scientific name *Hippophae* means "shining horse" because the plants were said to give horses a healthy coat of hair. Throughout the Eurasian steppe, the plants were used by indigenous people for food, forage and medicine.

In the 1930s, seaberries were introduced to Canada for shelter belts and reclamation projects. The plants have an extensive, rapidly growing root system, can grow on extremely poor and alkaline soils, fix nitrogen, and are drought tolerant, making them ideal for erosion control. The Canadians primarily planted seedlings with poor quality, and seaberries were not harvested. In the United States, seaberries remained largely unknown. In Minnesota, seaberries were occasionally planted as an ornamental in urban lawns. The berries were considered to "have a rather disagreeable flavor, but make a great sauce." (Sando, 1935)

The commercialization of seaberry fruit began in the 1940s in the Soviet Union. Soviet scientists began developing new products to take advantage of the health benefits of seaberry oils. At the end of the 20th century, most of the production and processing of seaberries switched to Mongolia and China, and China currently has between 150 and 200 factories that process seaberries.

USES AND HEALTH BENEFITS

Seaberries are rarely eaten fresh. Seaberries can be made into juice, jams, and jellies. The juice tends to be cloudy, primarily due to the high protein content of the fruit. Processing the juice is difficult, because heat destroys some proteins and oils which give seaberries their health benefits. Pulp left over from juice extraction can be used as animal feed or yellow dye. For Americans not familiar with seaberries, they may work best when mixed with familiar fruit in juices or added as an ingredient to protein snacks or granola.

Seaberry fruit is remarkably rich in a variety of medicinal compounds and nutrients. The berries are high in Vitamins C and E and even have a fairly high concentration of both protein and unsaturated oils. The oils are often extracted and used as medicine. Similarly, vitamins can be extracted from seaberries

for a natural source of vitamins.

Seaberries have been used in Chinese and Tibetan medicine for over 1000 years and are common in Asian pharmacies. The list of ailments rumored to be cured by seaberries is extremely long, but some of the best documented uses have been for skin care. Oil extracted from seaberries has been used to prevent sunburn, cure sunburn, cure burned skin, and cure skin damage from malnutrition. In addition, seaberry oil can reduce inflammation, reduce bacterial counts, and promote regeneration of tissues.[51]

PROPAGATION AND PLANTING

People interested in growing seaberries for fruit should only buy named, female plants. Most of the seaberries sold in North America are seedlings that produce sour, foul-tasting fruit, and half of all seedlings will be unproductive male plants. When buying seaberry plants, try to find sources with named varieties (all named varieties are female clones), so that Minnesota growers can compare the performance on known varieties. One male plant can pollinate 6- 8 female plants. Male seedlings will work as pollinators, provided their flowers open at the same time as the female flowers.

There are hundreds of seaberry varieties, but only a handful are available in the U.S. The most common cultivar in the U.S. is 'Leikora', a German cultivar that was originally sold as an ornamental with bright orange, sour berries and silver leaves that fit well into floral arrangements. In recent years, some nurseries have started selling varieties specifically chosen for fruit quality, including varieties that can be eaten fresh. Plant height, fruit color and fruit quality vary greatly between varieties. Several thornless and nearly thornless varieties have been developed in Russia and Germany, but are not available in North America.

Table 13. Seaberry cultivars available in the U.S.

Cultivar	Shrub Height	Fruit
Leikora	8-10 feet	Orange, intensely acidic
Amber Dawn	4-6 feet	Orange, sweet
Baikal Ruby	4-6 feet	Bright red, possibly sweet
Golden Sweet	12 feet	Yellow with sweet/acid flavor
Titan	12 feet	Large, light orange, less acidic
Siberian Splendor	Not Available	Light orange, suitable for fresh eating

Seaberry plants are difficult to find but are easy to propagate. Hardwood cuttings can be soaked in water and planted directly into a prepared bed. Softwood cuttings can also be used, but require a longer time in the nursery before being planted into the field. Once the plants are established, they spread rapidly in bare soil, and any shoots that sprout from roots can be dug up and transplanted.

Seaberries are native to cold deserts, and like most plants of the desert, they grow best in full sun. Plants in shade will stop producing flowers and fruit and can slowly die. Shrubs must be pruned regularly to allow sunlight to penetrate the plant, which will increase flower bud formation.

In the prairie provinces of Canada, there have been reports of seaberries becoming invasive, with one plant that became a thick stand covering an acre. The invasive nature does not appear to be a concern in humid climates. Seaberries do not grow in the shade, and once native trees grow over the seaberry plants, the plants slowly die. There are few reports of seaberries becoming invasive in the Midwest.

[51] Li, T.S. and Schroeder, W.R., 1996. Sea buckthorn (*Hippophae rhamnoides* L.): a multipurpose plant. *HortTechnology*, 6(4), pp.370-380.

PRODUCTION PROBLEMS AND COMMERCIAL POTENTIAL

The biggest barrier to commercializing seaberries is harvesting. Seaberries do not form an abscission layer, and therefore the fruit will stay on the plant until the middle of winter. The plants have spines that interfere with picking and the berries have to be pulled off the plants with force. The lack of an abscission layer complicates mechanical harvesting, which in most species works by shaking the fruit off the tree. The most common way to harvest seaberries is to cut off and freeze the branches and then shake off the berries by hand. The fruit hang onto the branches through the winter, so there is the potential of cutting and shaking branches in early winter.

So far, there have been no diseases found on seaberries, and the fruit does not attract Spotted Wing Drosophila.

There is a market for seaberries among Russian immigrants, and most Russian and Ukrainian immigrants are willing to pick their own fruit. Growers interested in selling to Russians should research varieties that immigrants want. There is a concern that the cost of picking seaberries is too high for the product to be sold at farmers' markets for a profit. Processed seaberry products are usually sold through health food stores, which rely on a supply chain from Chinese factories.

EDIBLE LANDSCAPING

One of the seaberry's greatest production problems provides its potential for edible landscaping: the berries hang on the shrubs for months after ripening, even during winter. The orange fruit and silver leaves will lighten up a landscape and work in floral arrangements.