SEA KALE

Crambe maritima

PERENNIAL VEGETABLE

Sea Kale: Intro & History

Sea Kale is a spreading, clump-forming perennial growing to 3' high and wide. In spring, it produces edible shoots and broccolis (buds). Established plants can be harvested over a period of days. Sea Kale is also grown as an ornamental. Its sprawling gray-blue foliage is offset by white flowers which smell of honey, are nectaries for pollinators, and bloom for weeks.

Sea Kale has been loved since Neolithic times in its native Europe, where it grows wild on the sea coasts of the British Isles, and from Spain to Finland. The young shoots were often blanched - covered in pots to exclude light and keep them sweet, tender, and white. It was once cultivated in the United States, but has retreated into obscurity since the 19th century.

Soil, Climate, and Site Selection

Sea Kale prefers a well drained, sandy or sandy loam soil. It is drought-tolerant, and can perform in heavier soils, but good drainage is critical for overwintering by using methods such as raised beds. Sea Kale is tolerant of cool, temperate climates, and established plants have been known to survive temperatures of -20F or lower during Zone 4 winters in raised beds in northern Vermont. Sea Kale prefers full sun, though may tolerate partial shade. During propagation, transplant, and early growth, it can be vulnerable to being shaded out. Sea Kale is a halophytic plant, adapted to living in salty soils.

Cultural Methods

In the first 1-3 years of growth, weed seedlings can establish between young plants, though once established, Sea Kale's foliage can provide its own weed suppression. A 2-4" application of straw, wood chips, mulch, or other organic material is recommended after establishment, after spring weedings, in the fall after weeding, and prior to winter. This protects soil and supports its biology, insulates plant crowns from winter temperatures, and contributes organic matter and nutrients. If synthetic material such as landscape fabric is used, consider removing the material before winter to minimize rodent overwintering habitat.

Watering upon establishment, and throughout the first season depending on weather conditions (if established in the Spring) is recommended. Hand watering, or drip irrigation, are both suitable options. After one season of growth, Sea Kale establishes deep and hardy roots, and rarely needs supplemental irrigation except during extended dry periods.

Propagation

Sea Kale readily propagates from root cuttings, which can be directly planted in beds, in pots for later transplanting, or stored. Its long flexible roots spread rapidly through the soil leading to clones emerging between plants. Root cuttings roughly 2-4" long and ¼" wide are ideal.

The end of the root piece closest to the crown of the mother plant will sprout leaves, offering a range of ways to propagate. Some experienced growers recommend that all crown-facing ends of the cutting are oriented up (tracking which end was closest to the crown by cutting one end on an angle), though our research indicated favorable propagation regardless of orientation.

If storing for planting later, unwashed root cuttings can be placed in a large plastic bag with damp organic material and placed in a cool dark environment or the refrigerator for weeks to several months. Cuttings should be monitored, with moisture controlled by opening or sealing the bag: roots should remain firm, not dry and desiccated or soft and rotting.

Sea Kale propagates best if the majority of the cutting sits vertically in the soil medium, leaving a ¼" of the cutting above the soil surface. If planting in pots, the medium should be evenly pre-moistened, and the cutting watered in. If planting directly into beds, it is recommended to plant in the spring, and to mulch and water in at planting. If planting for later transplant, plant 6-12" apart; if planting permanently, plant 2-3' apart. Monitor root cuttings and provide needed irrigation, making sure not to over moisten which can lead to rot. After 3-6 weeks, green and / or purple growth emerges which turns into small curly leaves, and eventually into the larger marine-colored leaves which identify it so clearly. Transplant is recommended anytime after full emergence of leaves. Given its rapid growth, Sea Kale may present challenges to pot based cultivation or nursery settings, requiring more frequent watering or repotting, and nutrient monitoring.

Sea Kale can also be propagated by seed, though this has not been addressed in our research. Some nurseries sell the seeds in their pea-sized pods, and recommend careful removal and immediate planting. To remove the seeds from their pods, one

can snip the pod off-center with wire clippers and gently break in half with vise grips set slightly smaller than the pod. Germination of seeds may take 7 days to multiple weeks: whole pods may prefer a number of weeks or months of cold / moist stratification (planting in the fall or very early spring in nursery flats or beds outdoors). Plants started from seed take 1 yr longer than propagated roots to establish, and during their first year remain relatively small.

Production & Economics

Although all portions of the Sea Kale plant are edible (young shoots and leaves in particular are favored and would benefit from more research), our research focuses on the broccolis produced in the spring. These broccolis are slightly more robust than broccoli raab, with multiple shoots which can be harvested per plant. Once harvested, shoots do not produce more brocolis.

The harvest window in northern Vermont (Zone 4a and 4b) has been the last 7-10 days of May. We know that variations in microclimate (aspect to sun, shadiness, soil type) can shift the harvest window by days on the same site, and weeks across growing zones. This spring harvest niche can provide a marketable product at a very early point in the growing season when many other plants are still seedlings. The broccoli with a top portion of the stem and side leaves can be harvested to make a very attractive and marketable broccoli bundle, similar to how broccoli raab is sold. Sea Kale stores well in a bag under refrigeration for 1-2 weeks.

Sea Kale establishes well in tilled and dug raised beds. It also performs with a no-till strategy: spread compost and minerals, decompact the soil using a broadfork, plant with a digging fork and soil knife, tuck a weed cloth (e.g.nursery fabric) around the plants on either side of the row, and after a growing season, remove the fabric and add mulch. Spacing 2-3' apart works best, but plants can be placed closer and divided as needed. If planting further apart, there will be at least 2 years where a different crop can be planted between those plants, provided it would not shade them out. If weeds are managed several times each season and adequate mulch is provided, the Sea Kale plot can be very low maintenance.

Plants will produce broccolis each spring for decades, giving more substantial yields starting around year 3. Anecdotal evidence suggests plants begin to decline in productivity after 20 years. Our sample harvests of the marketable portion of the broccolis in spring, on plants in their third and fourth year in the ground, have given a wide range of average sample yields from 1.8 - 3.7 pounds per plant, the equivalent of 4,764 - 9,768 pounds per acre. This follows our field plantings of 6' between rows and 2.75' between plants. More research is needed to determine at what age plant productivity tends to peak, but we estimate that yields would continue to increase for many more years, surpassing these initial results.

Sea Kale currently has a fairly high start up cost: there is currently a limited plant stock supply and a resulting high cost. This can be mitigated by producing a small number of plants from seed or root cuttings and growing them for 2-3 years, followed by harvesting root cuttings to plant production rows. Or one can purchase a small number of potted plants and after a season or two take root cuttings.

Pests

Few pests affect Sea Kale, likely due in part to the waxy nature of the mature leaf, and the early maturing broccolis. Flea beetles can be seen on the leaves of the plant at times, but they seem unable to affect the plant as they do most brassicas. There is no reported impact from Swede Midge or Cabbage Moth, though the latter have been seen around mature plants, meaning some consideration may be warranted for proximity to other brassicas.

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