

KULITIS



Scientific Names: *Amaranthus tricolor* L.; *A. viridis* L.; *A. dubius* C. Martius; *A. cruentus* L.

Common Names: Amaranth, Chinese spinach, Tampala, Pigweed (English)

Local Names: *Kulitis, Uray* (Tagalog)

BOTANICAL DESCRIPTION

The edible amaranth (*A. tricolor* L. or *A. viridis* L.) is an annual leafy vegetable belonging to the *Amaranthaceae* or amaranth family

Amaranthus- The plant is annual, erect, strongly branching up to 2.5 cm tall, and with branched taproot. The leaves are alternate, with long petioles, simple and entire. Flowers are borne in axillary clusters; upper clusters are often leafless. Fruits are dry capsules, close or open. Seeds are shiny black or brown.

A. Tricolor- the plant is annual, erect, up to 1.5 cm tall. Leaves are elliptical lanceolate, or broad-ovate, light green or red. Clusters of flowers are axillary, often spherical, but a reduced but occasionally well-developed terminal spike. The fruit is open, with a capsule-like lid. Seeds are black and relatively large (1200-2900 seeds/g).

A spiny relative of *kulitis* called *uray* (*A. spinosus* L) is a common vegetable in some regions in the Philippines. Though spiny, it makes excellent greens or pot herbs when used in the same way as spinach.

ADAPTABILITY

Kulitis adapts well under lowland condition at temperatures above 25 °C and night temperatures not lower than 15 °C. It is a short-day plant that consumes a large amount of water and thrives well in areas with six mm/day rainfall. It prefers fertile, well-drained soil with a loose structure.

USES/IMPORTANCE

Kulitis is one of the most nutritious leafy vegetables. It is used in stews, *sinigang* and other dishes whenever spinach (*Spinaceae oleraceae* L.) is not available.

Many wild *Amaranthus* species are used as pot herbs. Used as ornamentals are *A. tricolor* forms with red, yellow and green-colored leaves or leaf sections and *A.*

cruentus with large bright red inflorescences. *Amaranthus* weeds are used as fodder (pigweed). Vegetable amaranths have medicinal properties good for young children, lactating mothers and patients with fever, hemorrhage, anemia or kidney problems. The wild *A. spinosus* L. is used as a cure against venereal diseases and as dressing on boils.

NUTRIENT VALUE

Kulitis, per 100 g edible portion, contains water (84.4%), protein (4.6 g), carbohydrates (7.4 g), fibre (1.1 g), ash (2.5 g), vitamin A (12,860 IU), thiamine (0.1 g), riboflavin (0.37 g), niacin (1.8 g), and vitamin (C120) g. The energy value is 47 kJ/100 g.

PROPAGATION

Kulitis is propagated by seeds. Depending on the cultivar, photoperiod and cultural practices, flowering may start 4-8 weeks after sowing. The seeds mature after four-eight months and are a source of planting materials. However, *A. dubius* will continue its generative stage for a much longer period and when cut regularly, the plant may become shrubby and perennial. At its mature stage, the leaves are succulent and suitable for consumption.

PLANTING

Kulitis is planted by either direct seeding or transplanting. The choice of planting method depends on availability of seed and labor, and may also vary growing season. Direct seeding is appropriate when seeds are plenty, labor is limited and during the dry season when watering is less frequent. Transplanting is preferred when there is limited amount of seeds, plenty of labor and during the wet season when heavy rains and flooding are most likely to wash out the seeds.

The seeds are sown directly in rows 0.5-20 cm apart. Within the row, the seeds are sown 5 cm apart and covered with a layer of compost or rice hull. Broadcasting is done at a seeding rate of 2-5 g/m² (20-50 kg/ha). If transplanted, the seed requirement is only 2 kg/ha with plant density of 400 plants/m².

FERTILIZING

Although *kulitis* requires less management and can grow in poor soil, yield increases with the use of organic fertilizer.

WATER MANAGEMENT

Kulitis needs water just after sowing or transplanting to have a good stand. As a rule, the plants should be irrigated if wilting occurs at noontime. During the rainy season, drainage is essential for plant survival and growth. Raised beds, clean furrows, and large drainage canals facilitate quick drainage of excess water after a heavy rain. A way gauge soil moisture content is to take a handful of soil from the bottom of a 15-cm

deep hole. If the soil holds together when you release your grip; there is sufficient soil moisture; if the soil crumbles, irrigation is necessary. To maintain vigorous plant growth, avoid over-irrigation that may enhance disease development and nutrient leaching. Drip irrigation or micro-sprinkler irrigation can be used in areas with limited water supply. If sprinkler irrigation must be used, avoid doing this in the late evening to prevent diseases.

WEED MANAGEMENT

Kulitis is small-seeded and slow to germinate, therefore, weed control is essential in its early stage. A seedbed free of weed seeds allows the seedlings to get a head start on the weeds and establish a canopy that can shade out emerging weed seedlings. Hand or hoe weeding can be performed as needed.

PEST AND DISEASE MANAGEMENT

Kulitis is susceptible to damage by foliar insects such as leafminers, leafrollers, cutworms, aphids, flea beetles and mites.

The traditional method of pest control is by spreading wood ash to repel insects. Hot pepper solution may be sprayed for soft-bodied insects.

HARVESTING

Kulitis is ready to harvest 20-45 days after planting or sowing depending on variety and soil type. Plants may be harvested once or several times. On-time harvesting is adopted for short maturing and quick growing varieties such as *A. tricolor*. Whole plants are pulled from soil with roots, washed and tied in bundles. With multiple harvests, young leaves and tender shoots are picked at 2- 3 week intervals. Eventually, the plants begin to develop fewer leaves. Frequent harvesting of leaves and shoots delay the onset of flowering and thus, prolongs the harvest period. *Kulitis* and other leafy vegetables have large surface-to-volume ratio and lose water rapidly. To reduce water loss, harvesting may be done during the cooler time of the day such as early morning or late afternoon.

POSTHARVEST HANDLING

Since *kulitis* wilts rapidly, common practice in markets and shops is to sprinkle it with water to keep it fresh. If uprooted, *kulitis* can be kept fresh for some days by putting the roots in water in a basin. *Kulitis* are sold in bunches or by weight.

PROSPECTS/OPPORTUNITIES

Kulitis is recognized as an easy-to-grow, cheap and very productive crop. It is among the highest yielding leafy vegetable of the tropics with excellent nutritional value. Research should focus on optimization of cultural practices, effective pest control and plant nutrition.