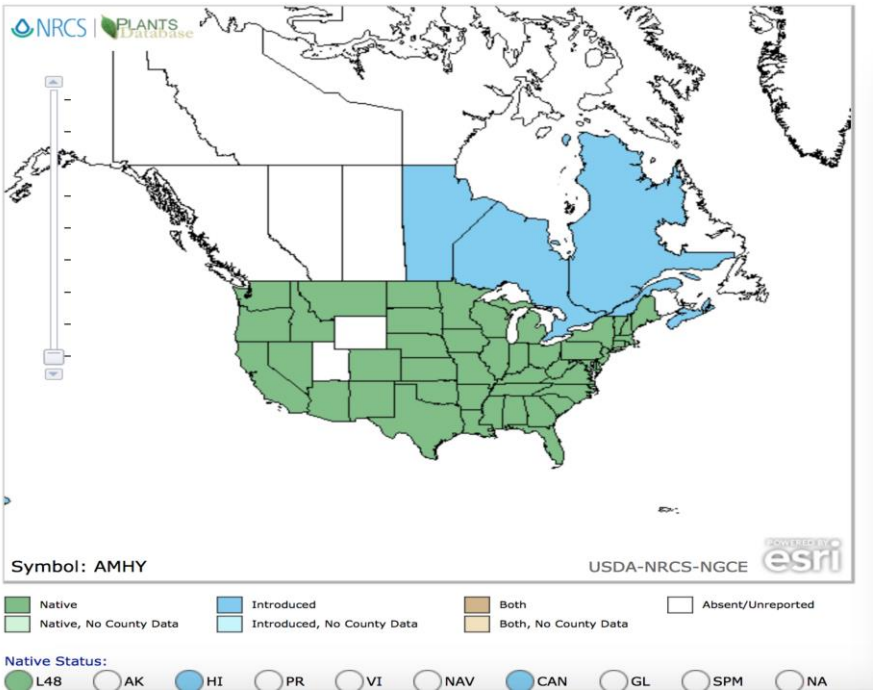
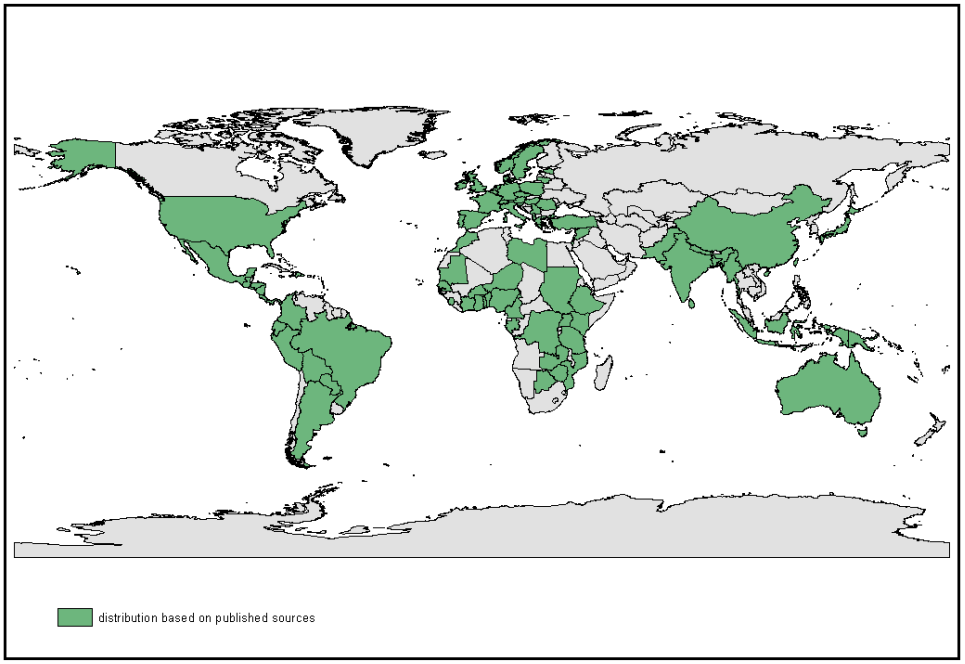
Plant Propagation Protocol for *Amaranthus Hybridus*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/amhy





World Distribution

TAXONOMY	
Plant Family	
Scientific Name	Amaranthaceae
Common Name	Amarnth family
Species Scientific Name	
Scientific Name	Kingdom: *Plantae* Order: *Caryophyllales* Family: *Amarnthaceae* Genus: *Amaranthus*
Varieties	
Sub-species	
Cultivar	
Common Synonym(s)	*Amaranthus aureus* *Amarnthus batalleri Sennen* *Amaranthus bellardii* *Amarnthus catechu* *Amarnthus eugenii*
Common Name(s)	
Species Code (as per USDA Plants database)	AMHY
GENERAL INFORMATION	
Geographical range	It is a native riverbank pioneer of eastern North America and parts of Mexico, Central America and northern South America It is much more common in the eastern than the western half of the USA. Its range has expanded to Africa, south-central Asia and Australia, possibly because of its use as a green vegetable.(1)
Ecological distribution	Light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. (2)
Climate and elevation range	This plant typically occurs in full sun, mesic conditions, and a loamy soil with high nitrogen content.
Local habitat and abundance	Habitats include weedy meadows, cropland, fallow fields, farm lots, vegetable gardens, gravelly areas along railroads, and waste areas. Highly disturbed and degraded habitats are preferred. The size of individual plants is highly variable, depending on soil fertility and moisture amounts. The seeds can remain viable in the soil for eat least 30 years.(3)

Plant strategy type / successional stage	Best grow within the range 12 - 30 ℃, but can tolerate 8 - 35 ℃. It can be killed by temperatures of 4 ℃ or lower. It prefers a mean annual rainfall in the range 400 - 600mm, but tolerates 300 - 700mm. (4)
Plant characteristics	The plant is self-fertile. It's a highly nutritious herbage and a potentially valuable forage crop It is an erect annual plant usually growing 10 - 20cm tall, occasionally to 60cm. (4)
PROPAGATION DETAILS	
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container
Stock Type	
Time to Grow	Grow them in green house. Germination: 3-4 days, 60F to90F. Seedlings emerge over an extended period, with major flushes in late spring or early summer. Planting time ranges from September to December, depending on soil temperatures.
Target Specifications	It is responsive to nitrogen and phosphorous. Plants grown in average garden soil will be four-feet to six-feet tall, while those grown in rich soil or compost may reach over eight feet.
Propagule Collection Instructions	Seeds can be removed by brushing or by beating the flowers in a bag. Passing the beaten flowers through a fine screen mesh can help to remove the seeds from the chaff.
Propagule Processing/Propagule Characteristics	An optimum plant population has not been established, but approximately 272 kg of seed per hectare is considered suitable.
Pre-Planting Propagule Treatments	In cool or dark conditions seed remains dormant, light and high temperatures break the dormancy. Pigweed seeds have multiple dormancy mechanisms, so that seeds produced in a given season germinate at different times over the next several years, thereby enhancing the weed's long-term persistence. Newly shed pigweed seeds are mostly dormant, and become less so by the following spring.
Growing Area Preparation / Annual Practices for Perennial Crops	Plant seeds in well drained rich in Nitrogen and Phosperous. Sow seeds early in the season and cover

	lightly with soil. Space seeds or seedlings 10-12" apart. Seeds should be planted not more than 1,25 cm deep, depending on soil texture and surface moisture at planting time.
Establishment Phase Details	Sow late spring in situ. An earlier sowing can be made in a greenhouse or in a nursery seedbed and then transplanted to their permanent position 2 - 3 weeks later.
Length of Establishment Phase	Germination is usually rapid and good if the soil is warm, but a drop in temperature overnight aids germination.
Active Growth Phase	They prefer a warm climate, full sun, and a well-drained soil. Water them during dry periods, once or twice per week. Add a general purpose fertilizer once or twice a season.
Length of Active Growth Phase	Depend on temperature
Hardening Phase	They are low-maintenance crops but weeds, especially at the beginning, should be discouraged by cultivation or mulching.
Length of Hardening Phase	Most amaranth cultivars grow rapidly and may be harvested from 30 to 55 days from sowing, when they reach a height of 0,6 m.
Harvesting, Storage and Shipping	Harvesting amaranth seeds is a simple process. Cut the seedheads just before they become dry and brittle. Lay the seedheads on a cloth or place them inside paper or cloth bags with heads down and leave in the shade to finish drying. When the seedheads are dry, the seeds can be removed in several ways: by rubbing gently with hands, by enclosing the seedheads between two cloths and treading on top without shoes on, by beating the seedheads inside of a bag, or by beating seedheads together over a cloth.
Length of Storage	
Guidelines for Outplanting / Performance on Typical Sites	A single large plant can mature 100,000–600,000 seeds, and populations of 0.1–1 plants per square foot can shed 10,000–45,000 seeds per square foot, or 0.4–2 billion per acre.
Other Comments	Weeds are the biggest pest in amaranth production. Early weeds are controlled by tillage or a contact herbicide prior to planting the amaranth. Pest control: There are no synthetic insecticides

	labelled for amaranth, but various organic insecticides can be used, including certain pyrethrum and BT products.
INFORMATION SOURCES	
References	See below
Other Sources Consulted	
Protocol Author	Shiheng Lu
Date Protocol Created or Updated	5/25/2016

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