SOLUTIONS IN THE LAND

CROP PROFILE

AMARANTH

Amaranthus
Genus of short-lived perrenial plants
Member of amaranthaceae family

History

Amaranth gets its name from a Greek word meaning “one that does not wither.” It was first cultivated by Aztecs many years ago. This plant played a large role in their worship, building statues of their deity using amaranth grain, and honey. These statues were then worshipped, broken down, and given out for eating.

Climate Needs

Amaranth responds well to high sunlight and warm temperatures. Since it is an annual crop native to the southern latitudes of North America, it does not mature completely in the upper Midwest’s short growing season. A frost is usually necessary to kill the crop so the plant material will be dry enough to harvest.

Risk

Amaranth is not a high-risk plant. Pests and diseases are the high-potential danger for this plant.

Amaranth Description

Grain amaranths have large colorful seed heads and can produce over 1000lbs of grain/acre. This plant can grow about 5 to 7 ft tall when mature and are dicot plants with thick, tough stems. The tiny, lens-shaped seeds are 1mm in diameter and usually white to cream-colored.

Soil

Amaranth prefers a fine and firm seedbed. Preparation can be done with a field cultivator or disk, followed by cultipacking or spiketooth harrow and planting, preferably using a planter with press wheels. Seeds should be planted no more than 1/2 inch deep. Amaranth is adapted to soils that have a pH of 6.5 to 7.5

Seeding

Amaranth is usually sown in late May or early June when soil temperature is at least 65°F. 1/2 to 2lbs of seed/acre is considered suitable. Approaches that have proven successful include: using a vegetable planter with a small plate appropriate for carrots or celery; using the in-furrow insecticide application equipment as a planter; or using a standard grain drill. Grain drills are not recommended due to problems in controlling seeding rate and depth, but they can be used if the amaranth seeds are diluted with a “carrier” like ground corn. A mixture suitable for drilling consists of a 1/2lb of amaranth with 4 1/2lbs of ground corn. Set the drill for a seeding rate of 5lbs/acre.

Fertility

P and K should test in the medium to high range in soil. A crop yielding 1200 lbs/acre of grain will remove about 36 lbs of N, 7 lbs of P, and 6 lbs of K per acre and various amounts of calcium and magnesium, and micronutrients.

SOLUTIONS IN THE LAND

CROP PROFILE

Weed Control

Early weeds must be controlled. Grain amaranths grow slowly during the first several weeks after planting, so 3 or 4 cultivations may be needed during this period. Once the amaranth plant is about a foot tall, it begins to grow rapidly and is very competitive with weeds. Two species of weeds that are competitive with amaranth are lambsquarter and pigweed.

Highlights

Amaranth can be used as a high-protein grain or leafy vegetable and has the potential as a forage crop. Grain amaranths are related to redroot pigweed but are different species with different characteristics and have not become weeds in fields where they have been grown. Grain amaranth is reportedly drought-tolerant, provided there is sufficient moisture to establish the crop.

Pest & Disease Managment

Damping-off of young seedlings can be a problem under some conditions, caused by pythim and rhizoctonia and stem canker caused by phorma or rhizoctonia. Tarnished plant bugs, flea beetle, and amaranth weevil are potentially significant insect pests of amaranth. The insect most likely to affect yields is lygus. Flea beetles are damaging to young leaf tissue. The adult amaranth weevil feeds on leaves, but the larval stage is more damaging because they bore into the central tissue of roots and occasionally stems, causing rotting and potentially lodging.

Harvest

A killing frost must occur before harvest, followed by a week of good drying weather. If the stems and leaves are too wet, the seeds become sticky and adhere to the inside of the combine. Shattering during the cutting process can also cause losses, so adjustments should be made to minimize shattering of the heads. Row headers are recommended for harvesting amaranth. High cylinder speed can damage grain and reduce germination and popping volume. Conventional combines can be used if fitted with appropriately-sized separator screens. Realistic yields from combine-harvested plots range from 600-1500 lbs/acre.

Cleaning & Storage

Clean using a 1/16-inch screen top and a 1/23-inch screen, 22 x 22, or 24 x 24 wire mesh on the bottom. Maximum moisture for storing the grain is approximately 11%. Small amounts of grain can be dried by blowing air across the amaranth; heated air may be necessary at certain times. The optimum way to store the grain after cleaning and drying is in wooden storage bins or heavy-duty (4 or 5-ply) paper bags.

SOLUTIONS IN THE LAND

CROP PROFILE

Rating any crop's production opportunity or risk is subjective and depends on the region where the crop is to be raised. Genetic advancement for pathogen tolerance and adverse weather condition has been more significant for popular, high seed sales crops such as corn and soybeans. The table below lists some of the issues of producing specific crops and helps guide your process of selecting your cropping choice.

Average rating: 3.14

Issue	1	2	3	4	5
Seed availability					X
Scouting requirements		X			
Drought tolerance				X	
Waterlogged soil tolerance				X	
Disease pressure		X			
Wildlife concerns		X			
Yield swings			X		
Harvest ability		X			
Field loss			X		
Market demand			X		
Soil regeneration			X		
Residue value			X		
Storability					X
Benefit for following crop			X		

1- very low 2- low 3- average 4- moderately high 5- very high

Seed availability – Price, lead time, and required lot size are considerations for these issues
Scouting requirements – What frequency does someone need to look at the crop?
Drought tolerance – Rainfall patterns are requiring crops go longer between rainfall events.
Waterlogged soil tolerance – Rainfall events tend to produce higher volumes than historical averages.
Disease pressure – Plant stress has increased with the rise of daytime temperatures
Wildlife concerns – Deer, rabbits, voles, resident geese, and others can destroy fragile crops.
Yield swings – How predictable will the income be when this crop goes to market?
Harvest ability – Do we need plans B & C if adverse conditions affect the harvest?
Field loss – How much will be left in the field and can we monetize field loss?
Market demand – Does this crop have an elastic delivery window and are there timing penalties?
Profitability – Is there potential for higher margins needed for a shrinking land base?
Soil regeneration – Does this crop support the next crop?
Residue value – What remains after the target crop? Can we monetize the residue?
Storability – How long can we hold this crop? Will quality be challenging to maintain?

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