



MEXICAN TEOSINTE

Zea mexicana (Schrad.) Kuntze

Plant Symbol = ZEME

Alternative Names

Common names: teosinte, annual teosinte

Scientific names: *Euchlaena Mexicana*, *Zea mays* L. ssp. *mexicana* (Schrad.) Iltis

Description

General: Grass Family (Poaceae). Mexican teosinte is a warm-season annual grass closely related to modern-day maize (*Zea mays* L). There is genomic evidence that *Zea mexicana* may be one of the predecessors of *Zea mays* (Yang et al., 2017 & Kistler et al., 2020). Like maize, male flowers are located at the top of the stem in a tassel while female inflorescences are formed in the uppermost 5 to 7 leaf axils. These spikes somewhat resemble ears of corn with sheath-like leaves that enclose the spike. However, unlike corn, teosinte spikes are much smaller than maize ears and only produce 3 to 8 triangular, hard, glossy ¼ inch long seeds. When mature, seeds dehisce from the rachis. Teosinte produces several stems which branch from the base and can grow 6-13 feet tall. Leaves are sword-like and grow 23-48 inches long and 2-3 ¼ inches wide.

Distribution: Mexican teosinte is native to Mexico and was introduced to the southeastern United States. For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Habitat: Teosinte is found along streams and hillsides in the highlands of central Mexico (Kennett et al., 2017). It can also be found in disturbed areas and bordering agricultural fields.

Adaptation

Teosinte populations do not have a uniform distribution across its native range which extends from the southern part of Chihuahua, Mexico to the western coasts of Nicaragua, El Salvador, and Costa Rica (Gonzalez et al., 2018). Mexican teosinte occurs in areas with Plant Hardiness Zones 8-12 and areas with 20-100+ inches of annual precipitation (USDA – Animal and Plant Health Inspection Service, 2014). It is adapted to a wide range of ecological conditions including dry sites, hot and humid areas, and is productive on somewhat poorly to well drained soils (Gonzalez et al., 2018). Populations of teosinte are associated with specific soil, climate, and human conditions (Gonzalez et al., 2018). In the United States, teosinte is best suited for the southern regions but may be grown in most areas where field corn is produced. Teosinte requires at least 200 frost free growing days for seed production (USDA-NRCS Brooksville Plant Materials Center, 2018).

Uses

Forage: Teosinte produces larger amounts of biomass compared to maize, especially during heat or drought stress (Niazi et al., 2015). It also provides highly nutritious forage that is readily utilized by livestock and wildlife in the summer. Stalks may be harvested for silage and fodder (Mohan et al., 2017).

Wildlife: Tall stalks and dense undergrowth of vigorous stands provide excellent cover for wildlife such as quail, dove, deer, or turkeys. Deer forage on young growth while seeds provide birds with a late-season food supply (USDA-NRCS Brooksville Plant Materials Center, 2018).



Mexican teosinte at anthesis in the field.

Conservation: Teosinte shows promise as a warm season cover crop due to its high biomass production, weed suppression, heat tolerance, and disease resistance (NRCS, 2018). It can be planted as a food for wildlife and is used in conservation programs because it provides cover and long-term food supply.

Cropping: Teosinte has several cropping uses. It is used as a high yielding forage crop and regrows rapidly after cutting (Sanjyal et al., 2022). It can also be used as a summer cover crop or as a green manure crop. Seeds shatter at maturity therefore, care should be taken to terminate stands prior to reproduction stage as seeds exhibit dormancy and may remain viable for several years, potentially becoming weedy if allowed to reseed (USDA-NRCS Brooksville Plant Materials Center, 2018).

Ethnobotany

The name *teosinte* is derived from the Nahuatl word *teosintle*, meaning “sacred ear of corn”. Teosinte was primarily used for the high sugar content in the stems. Stems were chewed to extract the sweet juices (Native Seeds Search, 2022).

Status

Threatened or Endangered: No

Wetland Indicator: No

Weedy or Invasive: This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed (Vibrans and Estrada, 1998). Mexican teosinte seeds shatter when ripe and will voluntarily reseed in areas due to an extended seed dormancy and ability to form a long-lasting seed bank (Sánchez et. al, 2011). Please consult with your local NRCS Field Office, Cooperative Extension Service office, state natural resource, or state agriculture department regarding its status and use.

Please consult the PLANTS Web site (<http://plants.usda.gov/>) and your state’s Department of Natural Resources for this plant’s current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Planting Guidelines

For best establishment, seeds should be sown in fertile soils with adequate moisture ranging from somewhat poorly drained to well-drained. Avoid planting on poor, droughty soils during the dry season or on wet, heavy soils during the rainy season. Weed competition should be removed prior to planting either by mechanical tillage methods or chemical control (USDA-NRCS Brooksville Plant Materials Center, 2018). Teosinte is a short-day plant and will not flower until day light length is less than twelve hours (Sanjyal et al., 2022). The seed bed should be well prepped by disking or roto tilling, weed free and firm. In production fields, broadcasting seed is not recommended. Seed should be drilled at 8-10 pounds per acre depending on the end use of the plants. Teosinte is a heavy tiller producer and reduced plant spacing causes plants to grow taller but produce fewer tillers. Each tiller produces female flowers thus closer plantings reduce seed yield (USDA-NRCS Brooksville Plant Materials Center, 2018). Teosinte can be planted with a commercial corn planter set for 36-inch row spacing and 1-2 inches seed depth. For conservation uses, seeds should be broadcast at a rate of 10-12 lb/acre followed by shallow disking or raking for seed incorporation and soil should be rolled or packed for proper seed-to-soil contact. Research has shown that burning plants in fall stimulates seed germination the following spring (USDA-NRCS Brooksville Plant Materials Center, 2018).

Management

Teosinte is a warm-season grass and growth of the seedlings tends to be slow early on, which can allow for increased weed pressure. However, once temperatures increase, plants grow quickly and once established, stands will produce a large amount of biomass (USDA-NRCS Brooksville Plant Materials Center, 2018; Sanjyal et al., 2022). Plant height can be controlled with clipping. Research has shown that once a dense stand of teosinte reaches a height of 3 feet, clipping plants to 6 inches will reduce plant harvest height from 16 feet to 13.5 feet and increase seed yield by 60 percent (USDA-NRCS Brooksville Plant Materials Center, 2018). However, only a single clipping is recommended as additional clippings had an adverse effect on seed production. Depending on spring rainfall, irrigation may be required. Fertilizer should be applied at planting and supplemented periodically according to soil tests. Follow local university recommendations for seed production of annual grain crops. When ripe, the seeds will turn a dark tan to brown. Teosinte is prone to shattering and herbivory, so plants should be harvested when at least 80 percent of the seed appears mature and should not be allowed to dry thoroughly (USDA-NRCS Brooksville Plant Materials Center, 2018). Any type of combine header that is used to harvest grain crops can be used to harvest teosinte. Mexican teosinte takes 112 days to produce a seed crop but can be harvested for forage before reproduction.

Pests and Potential Problems

Mexican teosinte is highly resistant to disease and other pest pressures that commonly affect corn populations (Niazi et. al, 2015; Warburton et al., 2011).

Environmental Concerns

A subspecies of teosinte can hybridize with modern maize, albeit at low rates, however maize does not cross with teosinte (Tritikova et. al, 2017). Care should be taken to maintain isolation when growing maize for seed.

Control

Seeds of teosinte can remain viable in the soil for many years and can even survive passing through the digestive tracts of animals. To prevent teosinte from voluntarily reseeding and becoming a weed problem, cutting, or mowing late in the season, prior to seed ripening, will limit seed production.

Please contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. Always read label and safety instructions for each control method. Trade names and control measures appear in this document only to provide specific information. USDA NRCS does not guarantee or warranty the products and control methods named, and other products may be equally effective.

Seeds and Plant Production

Teosinte requires a long growing season with high temperatures to produce seed. Planting can begin in April, but no later than June, to ensure seed maturity in the southern United States. Broadcast seeding is not recommended for seed production as row plantings result in more robust plants and higher seed production per acre. Teosinte should be drill seeded at depth of 1-2 inches using 8-10 Pure Live Seed (PLS) lb/acre. For maximum seed production, recommended spacing is 24 sq. ft. per plant (USDA-NRCS Brooksville Plant Materials Center, 2018).

Cultivars, Improved, and Selected Materials (and area of origin)

'Chapingo' Mexican teosinte was released in 1995 by the USDA NRCS Brooksville, Florida Plant Materials Center. Seeds were collected in Chapingo, Mexico and brought to the United States by the Texas Agricultural Experiment Station and distributed to the Tall Timbers Research Station in Tallahassee, Florida. Seed was obtained from Tall Timbers by the Brooksville PMC where it was planted in 1971. Chapingo requires approximately 112 growing degree days in Florida to permit tasseling and set seed. Plants can readily hybridize with maize.

Cultivars should be selected based on the local climate, resistance to local pests, and intended use. Consult with your local land grant university, local extension, or local USDA NRCS office for recommendations on adapted cultivars for use in your area.

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Citation

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