UNITED STATES DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

NOTICE OF RELEASE OF 'CHAPINGO' MEXICAN TEOSINTE GERMPLASM

The United States Department of Agriculture, Natural Resources Conservation Service, announces the release of 'CHAPINGO' Mexican Teosinte, [Zea mexicana (Schrad.) Kuntze]. Chapingo is an annual, warm season grass native to Mexico. It is adapted to the southern states and has been used for wildlife food and cover, as well as green manure crop in Florida. Plants are similar to corn and stand 10 to 12 feet tall, coarse, branching at base, flattened on one side between the dark-colored fruiting nodes; leaf blades sword-shaped, long-pointed, to 3 1/4 inch wide, midrib prominent, sheaths expanded, very strongly veined; female spikelets solitary on opposite sides of an obliquely articulate rachis, first glume hard, covering the cavity, second glume membranous, lemma hyaline; grains about 1/4 inch long, glossy, with a marking resembling an insect pupa on the face. Clusters (3 to 9) of slender "ears" are produced in each of the 5 to 7 uppermost leaf axils. Each cobless ear normally contains 3 to 8 very firm, easily separated seeds arranged in linear end to end manner.

'Chapingo' was introduced from Chapingo, Mexico, through the Texas Agricultural Experiment Station, and tested as PI-422162. It was obtained from Tall Timbers Research, Inc., Tallahassee, Florida in 1967 by Lew Yarlett, then State Range Conservationist for the Soil Conservation Service. Tall Timbers obtained it from Texas A & M University, College Station, Texas in 1965. In 1971 it was planted at the Brooksville, Florida Plant Materials Center.

The single accession was evaluated for potential wildlife uses on the Brooksville Plant Materials Center, comparing it to american jointvetch [Aeschynomene americana (L.)] on poorly-drained soil and partridge pea [Chamaecrista fasciculata (Michx.) Greene] on well drained soil. It performed well enough to be put into the field planting program on cooperator's land. Seed yields of one hundred to five hundred pounds per acre (average of 240 pounds) were obtained over six years after an initial seeding rate of 10 pounds per acre. Volunteer reseeding produced stands in subsequent years. Volunteer stands are improved by disking in March of subsequent years.

The field planting program demonstrated good seedling stands, seed yields, gamebird use, and volunteer reseeding in subsequent years from May and June seedings on poorly-drained soil. Florida plantings during the dry weather in April, resulted in poor stands and poor seed yields. July plantings often resulted in flooded stands or poor seed production due to a lack of time for flowering and seed maturity in fall.

500 grams of 'Chapingo' germplasm (PI-422162) seed are available to each applicant upon written request and agreement that appropriate recognition of the original source be given when this germplasm contributes to research or development of new cultivars.

Request seed from USDA Natural Resources Conservation Service, Plant Materials Center, 14119 Broad Street, Brooksville, Florida 34601.

Gary R. Nordstrom

Director, Biological Conservation Sciences Division
United State Department of Agriculture
Natural Resources Conservation Service
Washington, D.C.

9/29/95

Date

Niles Glasgow

State Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
Gainesville, Florida

10/5/95

Date

NOTICE OF GERMPLASM RELEASE

'CHAPINGO' MEXICAN TEOSINTE

The USDA-Natural Resources Conservation Service announces the naming and release of the germplasm 'Chapingo' mexican teosinte, [*Zea mexicana* (Schrad.) Kuntze]. This mexican teosinte was assigned the plant introduction number PI 422162. Mexican teosinte is an annual, warm season grass native to Mexico, stands to 10 ft. or rarely 15 ft., coarse, branching at base, flattened on one side between the dark-colored fruiting nodes; leaf blades sword-shaped, long-pointed, to 3 1/4 inch wide, midrib prominent, sheaths expanded, very strongly veined; female spikelets solitary on opposite sides of an obliquely articulate rachis, first glume hard, covering the cavity, second glume membranous, lemma hyaline; gains about 1/4 inch long, glossy, with a marking resembling an insect pupa on the face. It is planted in the southernmost states for forage and wildlife food. *Zea mexicana* (mexican teosinte) is closely related to and resembles *Zea mays* (L.) (maize or Indian corn), with which it readily hybridizes. Because of the similarity to maize or Indian corn, there is reason to believe the stalks could be harvested and used for silage.

Mexican teosinte was, at Brooksville, a good competitor with other plants and makes a seed that is hard, providing a long term food supply. Wildlife frequently prefer native plants such as partridge pea [*Chamaecrista fasciculata* (Michx.) Greene] and american jointvetch [*Aeschynomene americana* (L.)] to mexican teosinte. They will however, readily use the mexican teosinte whether standing or lodged when other food supplies are no longer available. Tall Timbers Research, Tallahassee, Florida, reports that burning the teosinte apparently stimulate the seed and increases volunteer plants the following year. Disking also stimulates additional volunteer plants.

Field plantings reported good insect and disease resistance. This plant has not shown any indications of becoming invasive of other crops planted near by, or any characteristics of a noxious weed.

Observations of plantings at Brooksville and in field plantings, show that deer and turkey use the stands of teosinte as cover. Deer have been seen foraging on the young growth and the ears. In a field planting near Liberty, MS, turkey were observed pushing the stalks over to obtain the seed. Smaller birds, such as quail and dove, must wait until the seed is on the ground before having it available for consumption.

Teosinte has performed equal to or better than the standard of comparison (american jointvetch) on poorly drained soils, but has only been equal to or poorer than the standard of comparison (partridge pea) on well drained to excessively drained soils.

Seed production at Brooksville has been used to make over 50 field plantings in MLRA's 133, 138, 152, 153, 154, 155, and 156. It has been found that spacing is a critical growth factor for seed production. Too close spacing produces plants with few if any seed-producing side branches, tall, lanky stems, and a much reduced seed production. With proper spacing, a single plant can cover up to 16 square feet and produce up to a pound or more of seed per plant. Tillering is decreased in denser plantings. Although plant height increases up to 16 feet (normal is 8-10 feet) seed production decreases. Taller plants reduce seed harvested when using a combine, since the seed is loose in the "ear" and shatters. An assessment after harvesting found that about 175 pounds of seed (roughly 1/3) was lost per acre during combining. Clipping once produces a shorter, denser plant with greater seed production.

TABLE 1

Teosinte Spacing/Seed Yield - 1988*

Spacing	Seed Yield	Per Acre Basis
3 Sq. Ft/Plant	4.9 gm/Plant	157 pounds
6 Sq. Ft/Plant	8.9 gm/Plant	142 pounds
12 Sq. Ft/Plant	24.3 gm/Plant	194 pounds
24 Sq. Ft/Plant	57.1 gm/Plant	228 pounds

*Planting was made at the Brooksville Plant Materials Center in Kendrick fine sand, and fertilized with 300 pd/Ac 10-10-10 at planting. Plants were dry when harvested; seed shattering was high. The "ears" were shredded giving the impression of heavy feeding by birds.

Regrowth patterns of the teosinte were studied in 1988, in an attempt to determine if clipping could be used to control plant height. A high population stand of teosinte was cut at a height of about 6 inches when it had grown to a height of 3 feet (June 1st). It was divided into areas I, II, and III. Area I was not clipped again. Areas II and III were clipped a second time (about June 15th), while area III was clipped a third time about July 1st. Plant density was 1 sq. ft/plant or less. The plants were harvested November 2, 1988.

TABLE 2

Teosinte Clipping Test 1988

Treatment	Height 11/2/88	gm seed/ sq. ft.
None	16.0 Ft.	2.7
No. I	13.5 Ft.	4.5
No. II	6.0 Ft.	1.5
No. III	2.5 Ft.	2.0

Plantings made in 1987 at Brooksville, indicated mexican teosinte is possibly photoperiod sensitive, with temperature interaction. In Florida approximately 112 growing days are necessary to permit tasseling and seed-set. Plantings made in April and May achieve this, later plantings produced progressively smaller plants, less days to tasseling and less seed. The latest plantings (September) tasseled in 60 days and produced no seed, see Table 3. For best growth, fertilizer must be applied at planting and supplemented periodically.

TABLE 3

SEEDING DATE AND FERTILIZATION - 1987 PLANTING[1]

MEXICAN TEOSINTE PI422162

Planting Date	Fertilizer[2]	Date Tassel	Days to Tassel	Height (cm)	Ave. Basal Shoots/Plant	Ave. Visible "Ears"/Plant	Ratings[3] Stand	Vigor
5/26	Y	9/15	112	250	3.1	7.7	3	3
	N	9/15	112	153	1.7	2.0	6	7
6/10	Y	9/30	112	242	3.0	5.6	3	3
	N	9/30	112	192	1.3	3.0	7	7
6/23	Y	10/02	101	207	2.9	5.6	4	4
	N	10/02	101	162	1.9	2.7	7	6
7/7	Y	10/05	90	168	2.4	2.7	5	5
	N	10/07	92	153	1.5	3.3	7	7
7/28	Y	10/05	69	40	1.8	3.2	9	5
	N	10/07	71	35	1.1	2.5	9	5
8/12	Y	10/19	68	70	2.0	3.3	5	6
	N	11/01	82	30	0	2.1	7	8
8/28	Y	11/04	33	40	0	1.1	7	6
	N	11/15	48	30	0	1.0	9	8
9/10	Y	11/15	48	40	0	1.3	6	6
	N	11/30	81	30	0	0.9	9	9
9/25	Y	12/01	66	10	0	0	6	6
	N	------	---	6	0	0	9	9

[1]Seeded on planting dates shown on Kendrick fine sand PMC dry site tiers, 60 ft. row per planting date, replicated three times.

[2]Y=one-half plot fertilized at rate of 200lbs/acre of 10-10-10 at 6 inch plant height and again at 15 inch plant height (total 400 lbs. 10-10-10 per acre).

[3]Rated 1 to 9; 1-excellent, 9 very poor. The 7/28 planting was made using a different seed lot of low germination.

Planting methods:

For best results plant on fertile soils ranging from somewhat poorly drained rating to well drained rating. Plow and thoroughly disk area prior to planting. Planting may be accomplished by either seeding in rows or by a broadcast means. Row planting has given higher per acre seed production and a more robust plant. When planting in rows seed should be planted at a 1-2 inch depth using 8-10 pounds per acre. Broadcast plantings at 10-12 pounds per acre are followed by shallow disking for seed coverage. Shattered seed will voluntarily germinate the following year. To encourage subsequent years stand the soil should be tilled by moderate to thorough disking in early March, prior to seed germination. Plantings may be made April 1-15 if irrigation is available until the rainy season, or approximately June 1. On sites that remain moist from April to June, early seeding can be made without irrigation.

Fertilization:

Fertilizer requirements are similiar to that for most grain crops. Application of N, P, and K should be based on a soil test. Organic and chemical fertilizers may be applied up to 50 pounds of N, P_2O_5 and K_2O.