

THE SOIL CONSERVATION SERVICE, ECOLOGICAL SCIENCES DIVISION  
WASHINGTON, D.C.

and

UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE

and

THE AGRICULTURAL EXPERIMENT STATIONS OF

Kansas State University  
Manhattan, Kansas

Oklahoma State University  
Stillwater, Oklahoma

NOTICE OF GERMPLASM RELEASE OF GYNOMOECIOUS SEX FORMS (GSF-I AND GSF-II)  
OF EASTERN GAMAGRASS, TRIPSACUM DACTYLOIDES (L.) L.

The Soil Conservation Service, the Agricultural Research Service, U.S. Department of Agriculture, the Kansas Agricultural Experiment Station, and the Oklahoma Agricultural Experiment Station announce the joint release of two new eastern gamagrass strains named GSF-I and GSF-II.

GSF-I (PI-483447) was selected as a single plant from an Ottawa County, Kansas, seed collection propagated at the Manhattan, Kansas, Plant Materials Center in 1981. GSF-II (PI-483448) was collected vegetatively from a wild population in Ottawa County, Kansas, from the site of the seed source of GSF-I in the spring of 1982. This was done as a part of an ongoing cooperative project between the Manhattan, Kansas, Plant Materials Center, and the Southern Plains Range Research Station, Woodward, Oklahoma, to select high seed producing strains of eastern gamagrass.

GSF-I and GSF-II are similar in growth habitat and foliage characteristics to the normal sex form (monoecious) plants of the area from which they were collected. They are semi-prostrate in growth habitat, with relatively narrow leaves and are susceptible to leaf rust. The inflorescence structure of GSF-I and GSF-II departs drastically from the normal with an exhibited gynomoecious sex form characterized by female flowers below and true (hermaphroditic) flowers above on the same structure. The lowermost pistillate spikelets and the thick rachis form a cupulate fruitcase association very similar to normal T. dactyloides. Above the cupulate fruitcase association, the inflorescence structure resembles the tassel or staminate portion of the normal sex form except spikelets are pistillate or hermaphroditic and the outer glumes are indurate and wider having female secondary sex characteristics. Rudimentary transparent stamens occur in florets along with fully developed pistils in the mid to upper section of the inflorescence. At the extreme tip of the racemes, spikelets contain fully functional (perfect) male and female florets.

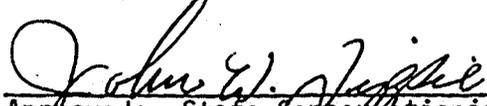
All spikelets contain two functional pistillate florets. This combined with the great increase in the number of pistillate spikelets results in a 20 to 25 fold increase in seed set compared to the normal sex form.

GSF-I and GSF-II appear very similar except GSF-I has slightly fewer spikelets with functional anthers, slightly narrower leaves, and stigmas are a darker purple compared to GSF-II.

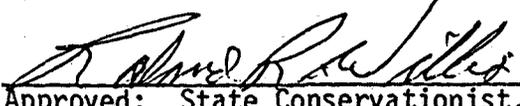
GSF-I and GSF-II are sexually fertile and produce fertile progeny when crossed with a wide range of T. dactyloides (L.) L. strains. The F1 progeny from such crosses is extremely variable in foliage characteristics and the floral system is of the normal sex form. Intermatings and selfings of the F1 progeny from gynomonocious x monocious sex forms result in segregation to both sex forms.

Use and Potential: These plants offer potential for increasing the seed production capabilities of T. dactyloides (L.) L. Low seed production and seed dormancy have remained major obstacles to the practical use of this plant in forage production. Successful utilization of this trait in Tripsacum breeding programs could result in high forage producing hybrids suitable for use in pasture and hayland and shoreline stabilization. GSF-I and GSF-II are intended to serve as sources of breeding material for incorporating high seed production into commercial forage cultivars of eastern gamagrass.

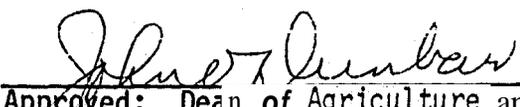
Cloned germplasm stock of GSF-I will be maintained at the Plant Materials Center, Soil Conservation Service, Manhattan, Kansas. Cloned germplasm stock of GSF-II will be maintained at the Southern Plains Range Research Station, Woodward, Oklahoma. Limited vegetative material is available for shipment during November through March.

  
Approved: State Conservationist, Kansas  
USDA-Soil Conservation Service

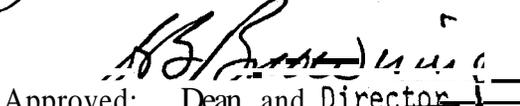
5/4/84  
Date

  
Approved: State Conservationist, Oklahoma  
USDA-Soil Conservation Service

6/8/84  
Date

  
Approved: Dean of Agriculture and Director of  
Agriculture Experiment Station  
Kansas State University

5/8/84  
Date

  
Approved: Dean and Director,  
Division of Agriculture  
Oklahoma State University

5-5-84  
Date

*T. B. Kenney*

Approved: Administrator  
Agricultural Research Service,  
Washington, D. C.

JUL 10 1984

Date

Approved: Deputy Chief, Technology Development  
Soil Conservation Service, Washington, D. C.

Date