

## *Manihot neusana* NASSAR, A NEW SPECIES NATIVE TO PARANA, BRAZIL<sup>1</sup>

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A new species of *Manihot*, *M. neusana* Nassar, was collected from the state of Parana, Brazil. It was grown and studied in the living collection at the Universidade de Brasília. The new species is closely related to *M. Pohlil* Warwa, but differs from the latter in geographic distribution, growth habit, fruit shape and color and seed shape and size. This species possesses interesting characteristics from a plant breeders view point, such as tolerance to low temperature, resistance to stem borers and an evergreen habit.

**Key words:** *Manihot neusana*, *M. Pohlil*, tolerance, low temperature, stem bore

[*Manihot neusana* Nassar; une nouvelle espèce originaire du Parana, au Brésil.]

Titre abrégé: *Manihot neusana* Nassar.

Nous avons découvert une nouvelle espèce de manioc, *Manihot neusana* Nassar, dans l'État du Paraná, au Brésil. Cette espèce a été cultivée et étudiée à l'université de Brasília. Elle est étroitement apparentée à *M. pohlil* Warwa mais s'en distingue par sa distribution géographique, le port des plantes, la forme et la couleur des fruits et la forme et la taille des graines. *M. neusana* possède des qualités intéressantes pour l'obteneur: tolérance aux basses températures, résistance aux perce-tiges et persistance du feuillage.

**Mots clés:** *Manihot neusana*, *M. Pohlil*, tolérance, basses températures, perce-tiges

Brazil has long been recognized as an area of unusually high genetic diversity for *Manihot* species providing cassava breeders with a valuable pool of germplasm (Nassar 1978a). Nassar (1979) has described the formation of gene centers and microcenters of this group, and has reported in further studies that these species when tested within the limits of their environment show a wide range of adaptation to heat, cold, drought, floods or diseases (Nassar 1978a, 1979, 1982).

Wild *Manihot* species have been collected from all over Brazil through our program to conserve, evaluate and utilize genetic resources of cassava. A monograph by Rogers and Appan (1973) was consulted to localize and identify different species. The collected species were screened in their natural habitat for tuber formation, growth habit and infection by insects or diseases. Moreover, soil samples were analyzed chemically to detect adaptatin of these species to aluminium toxicity. Data on rainfall and temperature in the natural habitat were collected from the meteorological stations to indicate possible tolerance to extyreme temperature and drought conditions.

The collected species were reproduced by seed and/or cuttings and maintained in a living collection at the experimental station of the Universidade de Brasília. In the following season seed was collected from these plants and planted, morphological characters of the progeny were recorded to determine whether the parent plants were true breeding or produced seed through natural hybridization. Observations on screening these species have been rported previously (Nassar 1978a, 1979, 1982, 1984).

One of the most interesting germplasm lines was collected from Parana in Southern Brazil, Latitude 25° S. It is so distinctive that it is proposed as a new species. This line was collected initially by Dr. Neusa da Cruz and tranferred to our living collection where it was reproduced and observed for four generations. It is a shrub of 2-3 m that grows vigorously and exhibits an evergreen habit, during the winter, in contrast to the majority of wild *Manihot* species and even cassava itself. For this reason it can serve well as animal feed, moreover, introducing the gene for evergreen habit to cassava may improve carbohydrate storage in the roots. This line was the only one that grew actively during the winter when all other *Manihot* species shed their leaves. This line is native to southern Brazil where the temperature is as low as 0°C in winter. It should therefore be a good souce of resistance to cool temperature. This line is very resistant to stem borers (*Silba pendula* and *Coelosternus* spp) which are serious pests of cassava in Central Brazil. During the 4 years of observation we did not record any attack of these insects on this species, while adjacent plants of other species were severely attacked. Thus, this species should be a good source of resistance to these two insects.

## Description

*Manihot neusana* is a shrub with branches which tend to droop; pubescent leaves; glabrous mature stems; stipules less than 1 cm long, 0.5 cm wide; pubescent, cadulous, petioles ca. 15 cm long, 5 cm wide, palmately 3-5 lobed; median lobes obovate-lanceolate, margins entire, apex acuminate. The inflorescence is monoecious, terminal, ca 5-10 cm long, bracteoles foliaceous, 1-2 cm long, 2-3 cm wide, margin entire, pubescent; bractlets foliaceous; the pistillate flowers are restricted to the base of the inflorescence. The fruit capsule is 1.5-2 cm long, spherical to oblong, surface pubescent, variegated in color green-white; the seeds are 1-1.5 cm long; caruncle rudimentary.

*Manihot pohlii* Warwa is a similar species. However, fruit of *M. pohlii* is conical in shape and is three times larger than that of *M. Neusana*, which is spherical to oblong ([see photo gallery](#)). The fruit of *M. Pohlii* is green, that of *M. Neusana* is variegated green-white with an ornamental pattern. Seed of *M. Pohlii* is spherical and three times larger than that of *M. neusana* which is oblong ([see photo gallery](#)). *Manihot pohlii* is confined to the states of Espírito Santo, Rio de Janeiro and Eastern Bahia (Rogers and Appan 1973). The introduction of this species, which are maintained in our living collection, were collected by me from Lençóis, Bahia State; *M. neusana* is native to Parana, the southern-most state of Brazil, about 2000 km from Bahia. Obviously there is no overlap in the geographic distribution of the two species and they have distinct habitats with a mechanism ensuring geographic isolation. It is possible that this new species and *M. pohlii* are two isolates of a common gene pool; however, the distinction of their geographic distribution, morphological characteristics, and climatic adaptation suggest they are quite distinct species. The variegated decorative fruit of this new line is also distinctive. The species description by Cruz (1967), several new taxa described in the monograph by Rogers and Appan (1973), and the discovery of this new species suggest that further collection in Brazil may reveal more new species in this genus.

## Latin Description of the Species

*Manihot neusana* Nassar sp. nov. Fruitibus ca. 3 m persistentibus monocaulibus; caulibus junioribus teretibus; stipularum marginebus integris; petiolis ca. 15 cm longis; foliarum labis medianis integris 15 X 15 cm bracteolis 2.5-3 X 0.9-1.2 cm; Florum discis rubis; capsulis variegatis apicibus truncatis; seminibus 1.2-1.5 cm longis carunculis rudimentalibus differt.

The material studied is being maintained in a living collection at the Experimental Station, Universidade de Brasília, and is represented by the accessions 201, 202, 203, 204, 205, 206, 207, 208 and 209. The holotype is deposited at the herbarium of Universidade de Brasília (UnB).

## ACKNOWLEDGEMENT

This work was carried out with the help of a grant from the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Brasília, Brazil. The living collection was initiated by the Canadian International Development Research Center (IDRC) between 1976 and 1980 to whom I am very grateful.

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(Received 14 Dec 1984, accepted 8 June 1985)

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