

## Ñipal F2016: variety of bread wheat for the Rural District 014

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### Abstract

Recent efforts in the Experimental Field of Mexicali Valley of the National Institute of Agricultural and Livestock Forestry Research have allowed the development of wheat varieties of high yield and industrial quality. Among these superior genotypes is the new bread wheat variety Ñipal F2016, which exceeds the yield of Cachanilla F2000 with 8.1%. It is also resistant to yellow linear rust, resistant to leaf rust, septoria, spica blight and shows good industrial quality. The seed of Ñipal F2016 is available in the Experimental Valley of Mexicali.

**Keywords:** quality, yellow rust, yield.

Reception date: November 2018

Acceptance date: December 2018

## Introduction

Wheat grown in the region of Rural District 014, which includes the Valleys of Mexicali, BC and San Luis Río Colorado, Sonora, is a spring growth habit and is planted, both hard and crystalline type, as the flour or baker during the autumn-winter under irrigation conditions. The bread wheat (*Triticum aestivum* L) was planted in about 14.6% of the 79 363 hectares planted in the 2016-2017 cycle in both valleys.

Based on the evaluations of grain yield carried out from the 2011-2012 cycle in the Valle de Mexicali Experimental Field (CEMEXI), it was proposed the release of the experimental wheat flour line WEEBILL 1\*2/KIRITATI as a new variety called 'Ñipal F2016'. The yield and quality comparisons were made with respect to Cachanilla F2000, the hardest wheat variety most planted in Rural District 014 in recent years.

This new variety was obtained by hybridization from the simple cross between two parent lines of the International Maize and Wheat Improvement Center (CIMMYT), WEEBILL used as a female parent and KIRITATI as a male parent, making a backcross to the parent WEEBILL in the F<sub>1</sub>. Hybridization and subsequent selection in the segregating populations was carried out by CIMMYT. Your crossover number and selection history is CGSS01B00063T-099Y-099M-099M-099Y-099M-25Y-0B. The simple cross was made during the summer 2000 cycle at the 'El Batán' experimental station of CIMMYT, near Texcoco, State of Mexico (19° 31' north latitude 98° 50' west longitude, 2 249 masl), the backcross was carried out during the winter cycle A-W 2000-2001 at the CIMMYT station in the Norman E. Borlaug Experimental Field (CENEB: 27° 21' west longitude 109° 54' west longitude, 40 masl) in Sonora. During the summer of 2001, the hybrid of the F<sub>1</sub> generation was sown in the experimental station 'El Batán' of CIMMYT, near Texcoco, State of Mexico, where selection was made for its resistance to leaf rust and agronomic type; the selected plants were threshed in masse.

Generation F<sub>2</sub> was planted during AW cycle 2001-2002 at the CIMMYT station at the Norman E. Borlaug Experimental Field in Sonora. The generation F<sub>3</sub> and F<sub>4</sub> were sown during the summer 2002 and 2003 respectively at the CIMMYT-Toluca station (San Antonio Atizapan, State of Mexico) and a selection was made for their resistance to yellow rust, agronomic type and yield potential. Generation F<sub>5</sub> was planted at the CENEB station during the winter cycle 2004 AW 2003-2004 and a selection of individual plants was made for their resistance to leaf rust, stem rust and agronomic type, the selected plants were threshed mass stop source to the next generation. The F<sub>6</sub> generation was planted in the CIMMYT-Toluca station (San Antonio Atizapan, State of Mexico) and a selection of individual plants was made for their resistance to yellow rust, other foliar diseases such as Septoria and even for their resistance to late blight. spike. The selected individual plants were threshed in bulk.

The generation F<sub>7</sub> was planted at the CENEB station during the AW/04-05 cycle and a selection of individual plants, individually threshed, was made. The individual plant that resulted in the variety Ñipal F2016 was number 25. Generation F<sub>8</sub> was planted in small plots at the 'El Batán' station of CIMMYT, near Texcoco, State of Mexico, during the 2005 summer cycle and harvested in mass to generate the fixed line that produced the variety Ñipal F2016. This line was evaluated in yield trials by CIMMYT in Sonora for two consecutive years and based on

positive results, and for its resistance to stem rust (UG99) it was selected for multiplication (as a candidate for the international trials of the CIMMYT) during the 2007-2008 cycle in Mexicali.

Beginning with the 2009-2010 cycle, the evaluation of the yield and industrial quality of the grain was started by INIFAP in the Valle de Mexicali Experimental Field (CEMEXI). Ñipal F2016, was registered in accordance with the Federal Seed Certification and Marketing Act in force in Mexico and has the final registration TRI-167-230217 of the National Catalog of Plant Varieties (CNVV) of the National Seed Inspection and Certification Service (SNICS) and the breeder's title with folio 1701.

The most important phenotypic characteristics for the description of this variety, in accordance with the guidelines of the International Union for the Protection of New Varieties of Plants (UPOV, 1994), Ñipal F2016 presents an anthocyanin coloration absent or very weak in coleoptile, its habit of growth in the stems is medium and expresses a high frequency of plants with curved flag leaf. Due to the shape, density and length, its spike is classified as pyramidal, lax and long, respectively. In the middle third of the spike, the glume shows a weak hairiness on its external surface and a narrow shoulder with an inclined shape, with a long tip. The grain is white, slightly elongated, with a medium length of the villus of the grain brush with dorsal view and when treated with 1% phenol it acquires a very dark coloration.

The yield performance and industrial quality were evaluated during four years in CEMEXI, starting from the agricultural cycle 2011-2012 and concluding the cycle 2014-2015. The results obtained indicate that the performance of Ñipal F2016 exceeds on average the performance of the control Cachanilla F2000 with 8.1%. The biological cycle of Ñipal F2016 is presented with 75 days at the head and 110 days at physiological maturity, with an average height of the plant of 95 cm.

Ñipal F2016, produces a grain with a weight of 42 g in 1 000 grains. On average, the protein content in grain is 12% adjusted to 12% moisture and contains gluten whose strength (W) is 231 joules and value of 0.67 of the tenacity/extensibility ratio (P/L) that indicates an adequate balance of gluten, classify it as a strong-balanced gluten suitable for semi-mechanized production of bread, whose average volume is 755 cc. The Experimental Valley of Mexicali, maintains the categories of original and basic seed of this variety.

## Conclusions

The new Ñipal F2016 variety is recommended for the Rural District 014 region, which includes the northern part of Sonora and Mexicali, BC. The basic seed of Ñipal F2016 is available in the INIFAP-Campo Experimental Valley of Mexicali, BC, for sale to seed companies that request it since December 2018.

## Cited literature

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