INTRODUCTION

In recent years, the whitefly *Aleurotrachelus socialis* has been a major pest of cassava, causing over 30% yield losses in different regions of Colombia. Due to its short life cycle (30-35 days), *A. socialis* populations increase rapidly and its ability to develop resistance to pesticides makes chemical control uneconomical. Plant host resistance is sustainable alternative for managing this pest.

The moderate to high levels of whitefly (resistance > 75%) in cassava is somewhat unique in cultivated food crops. The CIAT research program to identify whitefly resistance was initiated in 1978. A 1 to 6 whitefly damage and population scale was employed, where 1 indicates the absence of whitefly damage and population and 6 indicates the severest damage and highest population (Table 1 and 2).

More than 6000 cassava genotypes have been evaluated using these scales and different sources of resistance have been detected in several genotypes. Clone MEcu 72 has consistently express high levels of resistance. The variety Nataima-31 is the progeny of a cross between MEcu 72 and MBra 12. MBra 12 was selected as the male parent because of its high yield and desirable agronomic and culinary qualities.

**Evaluation of the CIAT cassava germplasm bank for whitefly resistance**

**ORIGIN OF Nataima-31**

Evaluation of the CIAT cassava germplasm bank for whitefly (*A. socialis*) A 1 to 6 whitefly damage and population scale was employed, where 1 indicates the absence of whitefly damage and population and 6 indicates the severest damage and highest population (Table 1 and 2).

Table 1. Population scale for evaluating cassava germplasm for resistance to whiteflies

<table>
<thead>
<tr>
<th>Damage Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>no whitefly stages present</td>
</tr>
<tr>
<td>2</td>
<td>1-20 individuals per cassava leaf</td>
</tr>
<tr>
<td>3</td>
<td>201-500 per leaf</td>
</tr>
<tr>
<td>4</td>
<td>501-2000 per leaf</td>
</tr>
<tr>
<td>5</td>
<td>2001-4000 per leaf</td>
</tr>
<tr>
<td>6</td>
<td>&gt;4000 per leaf</td>
</tr>
</tbody>
</table>

The original cross resulted in 128 progeny and these were evaluated for whitefly resistance, yield and cooking quality at the CORPOICA Research Station in Espinal, Tolima, Colombia. Of the 128 progeny, four (CG 489-34, CG 489-31, CG 489-23 and CG 489-4) were selected for low whitefly populations and no damage as well as the agronomic qualities described above. Nataima-31 is the 31st progeny of the 128 that were evaluated (Bellotti, 2003).

**VARIETAL REACTION TO WHITEFLY ATTACK**

Field evaluations on Nataima-31 reveal that whitefly ( *A. socialis*) populations are absent or very low. Whitefly populations and damage were considerably higher on the regional farmers variety, Aroma, and the susceptible control, CM40 (Fig. 4 and 5).

**THE RELEASE OF Nataima-31**

On March 28, 2003, Nataima-31 was officially released by the CORPOICA Research Station in Espinal, Tolima, with ICA (Instituto Colombiano Agropecuario) register number 008, July 10, 2002.

Several presentations were made describing the research process for developing Nataima-31 and containing its agronomic characteristics and recommended crop management practices.

During the field day, participants visited several field plantings of Nataima-31 where plants were harvested and root quality evaluated. Nataima-31 planting material (stem cuttings) was distributed to field day participants, the initial distribution of this variety.

**ECONOMIC, PRODUCTION AND SOCIAL IMPORTANCE OF Nataima-31**

It is estimated that the Colombianavicultric industry will require 290,000 tons of cassava for poultry feed. It is planned that the Departments of Tolima, Huila and Cundinamarca will plant 14,500 hectares of cassava toward this goal and by 2007; approximately 3,000 hectares may be planted to Nataima-31 in the high, warm Rio Magdalena valley. This could have the following effects on the region:

- An increase of 3,000 hectares with Nataima-31 above the already 6,900 hectares presently being grown using regional varieties.
- A generation of about 177,000 new jobs in the production phase, 48,000 jobs in the post harvest phase and 24,000 indirect jobs.
- A 25% yield increase from the present average of 10 T/ha to 20 T/ha with Nataima-31 for a regional average production of 12.5 T/ha.
- The 3,000 ha sown to Nataima-31 will produce 60,000 tons, and overall production will increase from 89,000 tons annually to 149,000 tons in 2007, an increase of 67.4%.
- A production cost reduction of 6.7% per hectare due to the reduced pesticide applications (a minimum of 3) presently being applied for whitefly control.
- Permanent water rights for 3,600, 7,200 kg of active ingredient of pesticides is being applied. This represents an expenditure of 324 to 628 million pesos. Planting Nataima-31 will reduce this cost.
- Nataima-31 maintains the high dry matter and quality of the regional cultivars and is superior in being less susceptible to physiological deterioration; this is an advantage in time of transport to markets.
- Nataima-31 will bring direct benefits to approximately 1,500 rural families and an indirect benefit to 4,500 families in the Rio Magdalena Valley region.

**REFERENCES**


**ACKNOWLEDGMENTS**

Numerous persons have contributed to the successful development into the development of Nataima-31. These include Octavio Vargas H., Gustavo Trujillo, Carlos J. Herrera, Josefina Mendoza, Cecilia Alzate, Julietto Bonilla, Luis Carlos M. Lopez and Arturo Mendoza.

Institutions that have supported this research include CORPOICA, JCA, Ministerio de Agricultura y Desarrollo Rural, Colombia, NZAD of New Zealand, USAID of the USA and CIAT.

March 8-14, 2004 – CBN-VI.