Provitamin A Maize Response to Environmental Stress Conditions

Many people in Africa suffer from vitamin A deficiency, which leads to blindness and other health problems in adults and children. The International Maize and Wheat Improvement Center (CIMMYT) in Mexico has developed orange maize inbred lines with high levels of β-carotene, the precursor to vitamin A. The problem is that many of these inbred lines are poorly adapted to the conditions experienced by small-scale producers in sub-Saharan Africa, such as heat, drought, and low soil fertility.

In a recently published *Crop Science* study, the orange inbred lines were crossed with drought-tolerant inbred lines, and the hybrids were evaluated for two seasons under four stressful conditions—drought, drought and heat, low nitrogen, and low phosphorus—and compared with corn grown in optimum conditions.

Sixteen hybrids performed better than the local checks under managed drought stress. One hybrid was among the top 10 hybrids in all the testing environments. Drought and low N stress reduced β-carotene by more than 60%, yet some hybrids retained a high percentage of β-carotene under stress conditions. This study identified hybrids that can be grown under adverse conditions while still retaining a good β-carotene content.


Orange maize after harvest. *Photo courtesy of CIMMYT.*

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