



Beans that Can Beat the Heat

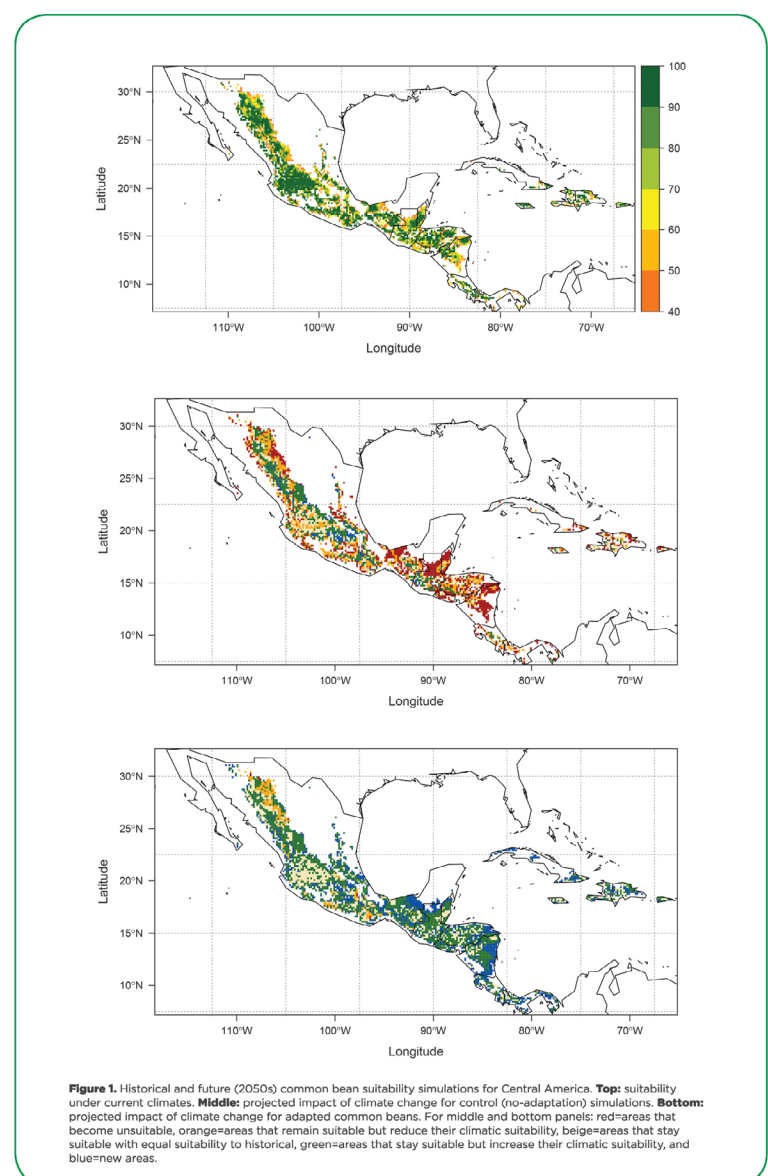
Beans, usually thought of as being highly vulnerable to climate change, are getting ready for extreme temperatures.

CIAT bean breeders have identified 30 new lines that can beat the heat, even with an average increase of 4 °C above the crop's optimal temperature range for growth. This breakthrough could prevent production from collapsing in extensive tracts of Latin America (Figure 1) and Africa where people depend on this grain.

The bean genotypes were selected through experiments carried out with more than 1,000 lines. These materials had already undergone improvement for tolerance to poor soil fertility and drought. But researchers turned their attention to heat tolerance after CIAT's climate change experts published an alarming report in 2012, warning that heat poses a much greater threat to bean production than had previously been believed.

The report suggested that increasing temperatures would have especially serious effects on bean production in Brazil, Haiti, Honduras, and Nicaragua. In Africa, Malawi and the Democratic Republic of the Congo were found to be the most vulnerable, followed by Tanzania, Uganda, and Kenya.

The heat-tolerant beans should be able to handle a worst-case scenario in which gradually increasing greenhouse gas emissions lead to an average rise of 4 °C in global temperature. Even if the improved beans can handle only a 3 °C rise, the loss of area suitable for beans as a result of climate change will be limited to just 5%. And farmers could potentially offset this loss by using the heat-tolerant bean lines to expand production. Heat-tolerant lines thus offer a lifeline for bean production in the face of a dire situation in which, by 2050, global warming could cut in half the cropland suitable for growing beans.



RESEARCH PROGRAM ON Grain Legumes



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