



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



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DISEASE-RESISTANCE GENE LOCATED IN SORGHUM IN BREAKTHROUGH DISCOVERY

Anthraxnose is a widespread disease caused by a fungus that can have devastating effects on sorghum production. It occurs in numerous locations around the world, and is especially prevalent in areas of high humidity, many regions in Africa and the southern United States. One research team, however, may have just unlocked a powerful key in the fight against the disease's destruction.

"Anthraxnose is one of the most important and widespread diseases in sorghum-growing areas," says Dr. Tesfaye Mengiste, an Ethiopian-born professor of plant pathology at Purdue University. "If a plant is exposed and does not have a gene for anthracnose resistance, it will die."

When the fungus that causes anthracnose attacks a plant, it multiplies in the leaves, feeding on the plant's nutrients until the plant can no longer photosynthesize. Inevitably, the entire plant will die. The end result is lost yields, lost income and lost food security.

Mengiste leads a team of researchers from Purdue University, the Ethiopian Institute for Agricultural Research, Oromia Agricultural Research Institute, and Holleta Biotechnology Center in a project aimed to enhance sorghum productivity and improve the livelihood of sorghum farmers in western Ethiopia through a collaborative research program focused on developing new, innovative interventions in crop disease resistance. The project is funded by USAID's Feed the Future Innovation Lab for Collaborative Research on Sorghum and Millet.

Anthraxnose is a common problem across Ethiopia, but is particularly brutal in the western half of the country, where it is significant and severe and can devastate fields and families. While larger scale

farmers in countries such as the U.S. have more ready access to fungicides to control fungal diseases, smallholder farmers in Ethiopia and other regions often experience much more limited access to inputs and treatment options, leaving them especially vulnerable to anthracnose and other diseases.

Mengiste's team has been looking for ways to fight anthracnose genetically in order to be able to introduce resistance to the disease directly into susceptible varieties, which would allow it to flourish even in the presence of the fungus without the need for fungicide treatments.

"Genetic resistance is the most sustainable and inexpensive way to control this disease," says Mengiste.

After years of research, Mengiste may have found just that. Recent results have shown that his team have successfully identified two key genes that carry anthracnose resistance in sorghum. These genes show the promise of integrating widespread anthracnose resistance into existing sorghum varieties in Ethiopia, and preventing countless food and income losses by smallholder farmers.

The next steps in the research, Mengiste says, will be to begin crossing the existing sorghum germplasms that carry the resistance genes into farmers' favorite varieties. Researchers will then select the materials that combine both the anthracnose resistance and other desirable traits to have overall better performing varieties at the disposal of Ethiopia's sorghum producers.

However, Mengiste's research will not stop at Ethiopia's borders. This important discovery will be applied to sorghum varieties planted around the world – including in the U.S. – to result in better crops to benefit all.

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Collaborative Research
on Sorghum and Millet



INNOVATING SCIENCE TO BUILD THE CROPS OF THE FUTURE...

DRIVING INNOVATION

The Feed the Future Innovation Lab for Collaborative Research on Sorghum and Millet is a global hub of cutting-edge research focused on increasing the resiliency of small-scale sorghum and millet producers in the face of climate change and creating entrepreneurial opportunities to reduce poverty and hunger.

The Lab's portfolio is aimed at the development of new technologies, management practices and food and feed products to help serve some of the world's most vulnerable populations. It enlists more than a hundred researchers, postdoctoral associates, graduate students and project management team members representing research centers, national programs and universities from around the globe to create a robust and impactful program to drive innovation in addressing food insecurity.

WHAT WE ARE DOING:

CLIMATE-SMART AGRICULTURE

Harnessing both time-tested breeding methods as well as the most advanced in genomic tools to create new crop varieties that are more drought, disease and pest resistant for improved yields and higher incomes for the smallholder farmer

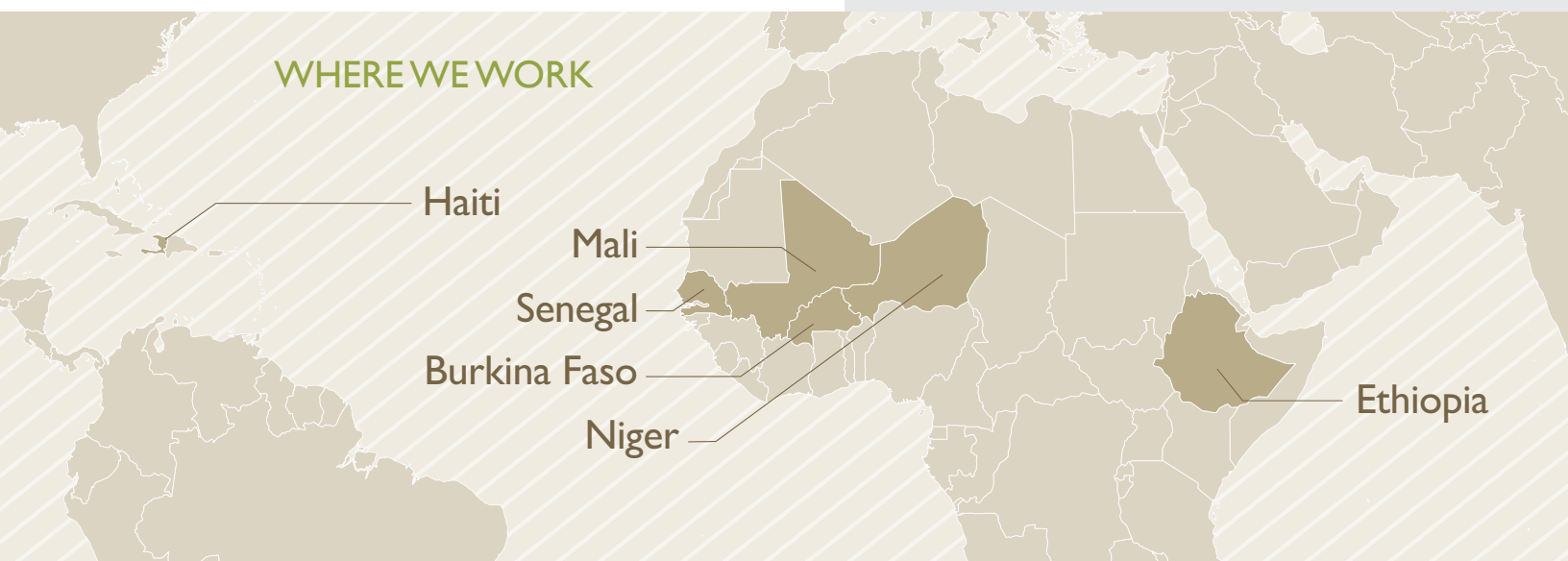
IMPROVED RESILIENCE

Designing innovative production techniques aimed at improving crop performance while combatting devastating pests in order to increase food security throughout rural areas

MARKET ACCESS AND DEMAND

Working to drive improved nutrition, business opportunities and higher crop value through a new wave of processed and fortified food products that meet growing demands by urban and rural populations alike

WHERE WE WORK



Collaborative Research
on Sorghum and Millet

FEED THE FUTURE INNOVATION LAB

FOR COLLABORATIVE RESEARCH ON SORGHUM AND MILLET

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