

Climate change is impacting production of beans in Uganda

STANLEY NKALUBO > FOOD SECURITY

The common dry bean is an important crop grown and consumed throughout Uganda, where it plays a very significant role in the livelihoods of many resource-poor farm households.

It is a major source of food and income for the rural smallholder farmers, especially women and children, and individuals involved in its retail trade at both national and regional level. The fact that beans are produced in every district not only shows the dependence on them as a major food security crop, but also their importance in the farmers' household economy. However, its production is being hindered currently by changes in climate.

Beans normally flourish well in temperature ranging from 18-26oC, however, temperatures are getting warmer in some areas and colder in other parts of Uganda. As a result, researchers are developing bean varieties that can withstand heat and cold stresses. In 2016, Uganda's bean crop experienced some heat stress in a few seasons when the surface temperature shot up to between 28-35oC. This led to low yields with some instances of crop failure where the heat persisted for more than two weeks.

Uganda is currently in mid stages of developing and testing bean varieties that can tolerate variations in heat in areas/regions where we are experiencing increased surface temperature due to reduction in rainfall and drought.

Many bean growing regions in Uganda have two seasons of crop production. The first season (March to June) has the greatest rainfall (720 mm), whereas the second season (August to November) has limited rainfall (560 mm) that rapidly diminishes.

Although this amount of rainfall is more than sufficient for the bean crop, rainfall patterns in Uganda have resulted into a number of bean growing regions receiving less than the anticipated shower, leading to intermittent and at times terminal drought.

As a result, there is a reduction in the soil moisture which ultimately creates crop drought stress leading to serious yield losses. Intermittent and terminal drought is becoming very prominent in the whole country. Since irrigation is unrealistic due to socio-economic constraints, genetic improvement for drought resistance provides the main opportunity to increase the productivity of beans grown.

Breeders in Uganda with their counterparts from Centre for Tropical Agriculture (CIAT) have developed bean varieties that can tolerate drought, the varieties are in their last stages of testing and will be released soon to help famers overcome this problem.

> **Varieties.** Pests and diseases are the leading constraint to bean production in Uganda and researchers have been and are still developing new bean varieties to combat the different diseases.

The new varieties have more leaves and numerous long roots closer to the surface to tap water from the drizzle. The serious concern for famers is when we have excessive rainfall. Unlike other crops, beans do not do well when there is too much rainfall.

Normally, with excessive rainfall, the bean crop is seen to yellow and rot away probably as a result of a buildup of diseases and this leads to heavy yield losses. This is a serious problem where farmers receive rainfall almost on a daily basis and researchers are yet to embark on developing bean varieties that can withstand excessive rainfall.

Climate change has also resulted in the emergence of new pests and diseases. Further, there has been a change in form of the old pests and diseases, making it harder for farmers growing the crop. Sometimes, the numerous pests and diseases may occur in the same field at the same time. Pests and diseases are the leading constraint to bean production in Uganda and researchers have been and are still developing new bean varieties to combat the different diseases.

In Uganda, climate changes have led to new diseases such as rot rots, anthracnose, angular leaf spot, rust, white mold, and pest like bean leaf beetle, aphids, bean pod borer, leaf hoppers, white flies, and flower beetles.

The biggest challenge is inserting all the resistances for the different diseases in the same bean variety. This is not easy and normally requires the use of molecular technology to assist the researchers to do this. These and other bean production constraints have increased in the face of the changing climatic conditions and weather patterns.

In the face of climate change, beans production in Uganda has progressively become difficult as farmers are losing the crop either to drought or to too much rainfall which also results in the buildup of emerging and reemerging pests and diseases. Researchers are trying to minimise the effects of climate change by availing new and improved bean varieties that can tolerate these climate change-initiated challenges as they arise.

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