

Grass pea 'silver bullet' for drought and waterlogging

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Its low cost, low input nature makes it a prime feed crop. Credit: Global Crop Diversity Trust

Research into the first ever Australian-bred and released grass pea variety has revealed its ability to enhance nitrogen (N) and Potassium (P) uptake in wheat crops.

The work comes from Dr. Marcal Gusmao, UWA's first PhD from Timor-Leste, whose work will help improve crop yields in his homeland.

Grass pea is a hardy annual legume with a growth habit similar to field pea, characterised by resistance to both drought and waterlogging. Its low cost, low input nature makes it a prime feed crop.

It has been restricted in use, however, due to the presence of neurotoxin

ODAP, which causes paralysis of the lower limbs (lathyrism).

This was overcome by the breeding of cultivar Ceora (*Lathyrus sativus*) by Dr. Colin Hanbury, Prof Kadambot Siddique and Dr. Ashutosh Sarker of the Centre for Legumes in Mediterranean Agriculture (CLIMA).

With an ODAP level of 0.04 to 0.09 percent, Ceora virtually eliminates the toxin's effects, making it safe for animal consumption.

Dr. Gusmao has delved deeper into the plant's benefits.

“Prof Siddique's field trials showed that grass pea was well adapted to the southern environment of WA where water deficits during reproduction are common,” says Dr. Gusmao.

“Questions remained were about adaptation mechanisms to water deficits and whether or not grass pea improves soil fertility.”

Dr. Gusmao's study revealed that under moderate water deficit, Ceora avoids dehydration through a reduction in green leaf area and stomatal conductance. This enables the plants to maintain the water status and photosynthesis of the remaining leaves to support seed yield.

Under high stress, flower production and pod production is highly limited and the grass pea produces some seed by concentrating its resources in a small number of surviving pods.

The plants also mature early to escape drought.

“These adaptation strategies are important in southern Australia where rainfall in the growing season is variable and terminal drought is a common feature,” says Dr. Gusmao.

As for soil fertility, wheat grown in soil after grass peas produced 12 per cent greater dry mass and 16 per cent more green area than wheat planted after wheat. Wheat shoot N and P content was also higher.

Dr. Gusmao is now passing on his findings and methods to students at the National University of Timor-Leste and working with a United Nations development program on climate change.

Forty per cent of Timor-Leste's households rely on subsistence agriculture, with food shortages common for up to four months a year.

Provided by ScienceNetwork Western Australia

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