



Factsheet

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Climate-Ready Crop Research to Improve Food Security

Research is underway in Pohnpei, the Federated States of Micronesia (FSM), to determine more climate-ready and disease tolerant crops that can be grown by local people to help improve food security.

“Before, the weather in Pohsoain was normal. Now the temperature has changed; during summer it’s very hot and during rainy season it’s very cold,” said Mr Koaroamw en Pohsoain, of Pohsoain Village in Kitti, Pohnpei, FSM.

Climate variability and change is resulting in higher temperatures, change in rainfall patterns and more powerful cyclones that is impacting local crops, for example some local yam varieties are dying or decreasing in size and yield. One approach to the problem is to determine climate-ready crops best suited to FSM and the North Pacific, then encourage people to grow those crops.

In Pohnpei research is testing the resilience of varieties of cassava and taro to climate change, and also testing the resilience of taro varieties to Taro Leaf Blight (TLB). SPC’s Pacific Agriculture Policy Project (PAPP), College of Micronesia – FSM, COM-Land Grant, and the FSM and Pohnpei Agriculture Departments, and other partners are collaborating in these research activities.

Nine varieties of cassava and 11 varieties of taro currently growing in Pohnpei are being tested in the trial agriculture plot.

“This is the first time Pohnpei’s varieties of cassava and taro will be collected and documented,” said Mr Poasa Nauluvula, SPC PAPP Participatory Extension Advisor based in Pohnpei, FSM.

What is Taro Leaf Blight?

Taro Leaf Blight is a highly infectious fungal disease. It causes the leaves of the taro plant to wither, reducing its ability to photosynthesise and therefore to grow. In some cases it can also cause the taro root to rot.

It is an extremely destructive disease, reducing yields by 30-50 per cent¹. Although in some cases – such as in Samoa in 1993 – the crop was almost entirely destroyed.

Taro is an important staple food crop across the Pacific Islands. Taro Leaf Blight (TLB) represents a major threat to food security in the region. With most local taro varieties not resistant to TLB, research to identify and breed resistant varieties is crucial to the region’s food security into the future.

¹ *Taro cultivation in Asia and the Pacific, produced by the FAO Regional Office for Asia and the Pacific. Downloaded from the FAO Corporate Document Repository 8/11/16: <http://www.fao.org/docrep/005/ac450e/ac450e06.htm>*

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SPC PAPP Participatory Extension Advisor based in Pohnpei, FSM.



At the cassava and taro research plot is (from left) Poasa Nauluvula, FSM's SPC PAPP Participatory Extension Advisor and Jackson Phillip, Program Coordinator, College of Micronesia's CRE.

“They are being compared with regard to their resilience against climatic stresses to identify climate change resilient varieties best suited to Pohnpei, FSM and the North Pacific,” said Mr Nauluvula.

According to Dr Nat Tuivavalagi, the Agronomy Researcher at COM-FSM, these experiments could prove valuable in the future to assist farmers better deal with the negative impacts of climate change.

“We may find that there is a local cassava or taro variety that can better tolerate drought or saline soil conditions,” Dr Tuivavalagi said.



Taro Leaf Blight causes the leaves of the taro plant to wither reducing its ability to grow.

Cassava Drought Resistance

Cassava has been identified as a drought tolerant crop ideal to improve food security for FSM communities struggling to grow crops in drier conditions. It can grow with limited water, and in degraded and acidic soils, making it ideal for a famine reserve for subsistence farmers' food security and as cash crop.

The two-year cassava research project will enable the researchers to gain a better understanding of cassava varieties that exist in Pohnpei and they will also be exploring whether there are pruning methods that could increase cassava productivity for the benefit of local farmers.

“We need basic information about the cassava varieties we have in Pohnpei so then we can plan what needs to be done next, such as whether there is a need to import new varieties that are not yet here,” said Dr Tuivavalagi.

“Another very important benefit of the project is that it has provided a training ground for various groups of people including high school students, college students, COM-FSM college staff, Agriculture Department staff, and farmers.”

The researchers are interested in cassava and taro given that these crops could help with four issues facing Pohnpei and FSM: food security concerns, negative impacts of climate change, low level economic activity, and the high incidence of diabetes and other non-communicable diseases (NCDs). They will also be exploring how these cassava and taro varieties will perform under degraded soil conditions that exist in various parts of Pohnpei.

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Dr Nat Tuivavalagi
Agronomy Researcher at COM-FSM

Taro Leaf Blight Resistance

The taro project aims to identify and also breed varieties of taro that are resistant to Taro Leaf Blight (TLB), a major food security threat in the Pacific Islands and Asia. The method is to initially start work from the agriculture plot then expand to promote on-farm taro breeding and selection for TLB resistance in the North Pacific, in particular Pohnpei and the other three States of FSM.

The taro project has two key components, to characterize and document local taro varieties, and also breeding work to determine TLB resistant or tolerant cultivars via the formation of breeders' group involving members from various agriculture workplaces including farmers.

The taro research project involves 11 varieties, of which nine are local and two are from overseas.

"Taro is an important staple food crop for the people of the Island States in the North Pacific just like in the South Pacific. But the TLB disease is prevalent here and it has wiped out some good taro varieties and is threatening food security for many communities up here in the North," Mr Nauluvula said.

"This research is very important; for example in Samoa in the late 1990s the non-resistant varieties of taro were decimated by the TLB disease, and we don't want that to happen in the North Pacific," he said.

"At this point we have collected 11 taro varieties so we can soon start cross-breeding for TLB resistance for the North Pacific. Fiji started doing this about three years ago and will soon be selecting varieties that suit their local conditions and will be resilient tolerant to TLB," Mr Nauluvula said.

The taro project aims to:

- Document the taro varieties for the North Pacific, focussing on Pohnpei.
- Identify through participatory breeding and progressive selection processes at least one or more TLB resistant varieties of taro best suited to the North Pacific. This is from cross breeding of desirable varieties that are

Sharing Knowledge is Essential for Growth in the Agriculture Sector

It is early days for the Pohnpei-based climate-ready crop research into nine varieties of cassava and 11 varieties of taro. But already it is hoped that the outcomes and lessons learned from the on-farm trials are shared by extension officers, communities, nations and regions to help the agriculture sector deal with the impacts of climate change and address food security concerns.

Ensuring information about such Community Supported Agriculture (CSA) and climate change initiatives are shared and replicated across agriculture extension officers, farmers and others in the sector is essential. For example, the technical advisors from SPC and the national and state agriculture officers have encouraged farmers from Pohsoain, where some previous trials for yam intercropping and climate-ready crops have taken place, to share their lessons learned. As a result the community has invited nearby farmers to visit and learn from the trials.

Through this process of knowledge sharing, other communities are learning about the successful approaches so they too can benefit, and assist their residents to have better food security.

going to be identified from the collection. These varieties will then be promoted to farmers.

- Better understand the basic principles of participatory breeding and its importance to food security in a rapidly changing climate.

The breeding component of the project will involve participation from local extension officers, farmers and other agriculturalists who will undertake training, including training of trainers, to equip them with the technical and other knowledge required to assist them to design and implement the taro breeding initiative. These participants will form a Breeders Group, central to the TLB on-farm research.

Farmer Participation is Key to Success

Central to the research is ensuring the participation of farmers, especially in the next stage that involves on-farm testing and then ongoing adoption of more climate change ready resilient crops.

“Getting farmers’ involvement means success,” says Jackson Phillip, Program Coordinator with one of the research project’s partners, the College of Micronesia’s Cooperative Research and Extension that is collaborating with the United States Department of Agriculture (USDA).

“Things that farmers are involved with or that they initiate, then those things really go forward,” Mr Phillip explained about the participatory approach to the cassava and taro research.

The research is likely to have benefits that range across the North Pacific. Future plans are to expand this work to the other FSM States of Kosrae, Chuuk, and Yap, the Republic of Palau, the Commonwealth of the Mariana Islands and the State of Guam.

The ultimate goal is to expand the diversity and use of disease tolerant and climate resilient taro and cassava varieties across all of the North Pacific.



Displaying the research plot’s taro varieties is Jackson Phillip, Program Coordinator, COM’s CRE.



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