

Has the MRCU conducted or is it currently conducting any research involving genetically modified mosquitoes?

The MRCU has recently begun looking into conducting research into GM mosquitoes; we have begun working alongside a UK based company – Oxitec (www.oxitec.com) to look into the feasibility of non-insecticidal control of *Aedes aegypti* the Dengue mosquito in Grand Cayman.

Currently research is laboratory based to ensure this mosquito can compete effectively against the wild type males *Aedes aegypti* mosquitoes we have here in Grand Cayman (see experimental overview for more information).

Has the MRCU released any GM Mosquitoes in Cayman and if so where?

To date the MRCU has not released any GM mosquitoes in Cayman

Is the MRCU planning to release any GM mosquitoes in Cayman and if so where?

Research is still in its preliminary stages, however if laboratory tests indicate that the release of GM mosquitoes are likely to reduce the population of *Aedes aegypti* in Cayman then small field trials will likely be carried out. At this point in time it is not certain where these test sites may be located.

Do the MRCU have to have public consultation before releasing GM mosquitoes into the environment?

There is no law in Cayman that mandates MRCU will have to hold public consultation before releasing GM mosquitoes; however MRCU will ensure the public are notified of any plans to release this mosquito. This will only occur if laboratory experiments indicate that control of *Aedes aegypti* is feasible using the GM mosquito. Given the lack of legislation in Cayman concerning the release of Genetically Modified Organisms MRCU is consulting with Oxitec, the Department of Environment and the Department of Agriculture to ensure that all concerns relating to the release of these mosquitoes are addressed.

What steps do MRCU need to take before embarking on a research programme?

As a matter of course MRCU will be carrying out an environmental impact assessment as well as risk assessments. Also consultation with other Government departments that have an interest in this area.

What legislation does MRCU need to adhere to while undertaking research?

See previous – there is no official legislation regarding the release of GMO's, however we aim to practice as if such legislation were in place.

Experimental Overview

MRCU are collaborating with the UK based company Oxitec in order to determine the feasibility of non-insecticidal control of *Aedes aegypti* in Grand Cayman. The premise is based on the classical sterile insect technique that has been used for insect pest control in excess of 50 years.

Traditional Sterile Insect technology relies on using radiation to make male insects sterile. As most female insects (in our case *Aedes aegypti*) only mate once, if a wild female mates a sterile male, she will only lay non-viable eggs resulting in a reduction in the population, the more sterile mating that occur the greater the reduction in the population.

This traditional technique is not without its drawbacks; primarily the use of radiation in order to sterilize in the regions of millions of male insects, the equipment required and the 'fitness' cost to the insects. It has been proven that insects treated with radiation are not as fit as wild type males and therefore do not compete effectively, meaning many more are needed in order to have an overall effect on the population.

As an improvement on this the mosquito we are looking to work with has been made genetically sterile, that is it contains a gene that is passed onto its offspring that mean they are unable to survive to adulthood. This has many benefits over the traditional Sterile Insect approach. Not only does it negate the need to have big expensive plants full of radiation equipment, it means the GM males are not weakened by radiation and should be able to compete successfully with the wild males out in the field – this is work we are currently working to confirm in our laboratories.