ASIAN "KIBO" MISSION PLANNING: "SPACE SEEDS FOR ASIAN FUTURE" PROGRAM : MALAYSIA SPACE SEED (AstroSeed) PROGRAM

The Asian "KIBO" Mission Planning Task Force is a sub session of the Space Environment Utilization Working Group (SEU-WG) in Asia-Pacific Regional Space Agency Forum (APRSAF). The task force aims to joint utilizations of the Japanese Experiment Module "KIBO" of the International Space Station by countries in the region. Malaysia is one of the member of the task force.

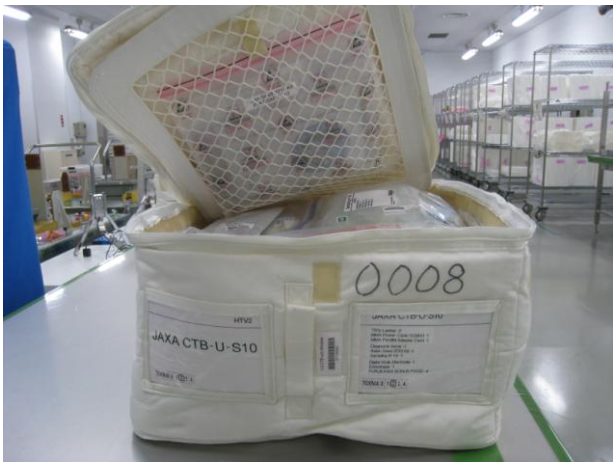
National Space Agency (ANGKASA) is already established a local committee to conduct this program. The committee console of Malaysian Agricultural Research and Development Institute (MARDI), Ministry of Education (MOE) and Department of Agriculture (DOA). We were agree to have 2 component which is education and research program.

a. Preparation seed to Japan Aerospace And Exploration (JAXA)

Malaysia had selected 100 grams of Capsicum annum (cv MC11) seed to send to ISS. The seed were prepared by MARDI researchers. MARDI and DOA researchers has do the seed treatment to the MC11 on 13th November 2010. This process is done as the standard procedure for all biological product include seeds that need to export.

b. Space Seeds in ISS

The seeds were launched to the International Space Station (ISS) aboard "KOUNOTORI2" (HTV2, a cargo transporter to the ISS) by JAXA on 22 January 2011.



Pic 1 : Seeds Packaging flown to ISS

c. Development of Malaysia Space Seed Education Module

The education module has develop together in 3 series intensive discussion between representative from Ministry of Education (MOE), Malaysian Agricultural Research and Development Institute (MARDI), National Space Agency (ANGKASA), 2 expert in agriculture from the Universities and teachers who are involves directly with students. Through those series of discussion a comprehensive research module has satisfies all the stringent requirements from all the parties involves as mention above.

Pic 2 & 3 : 1st series of Development of Education Module

Pic 4 & 5 : 2nd series of Development of Education Module

Pic 6 & 7 : 3rd series of Development of Education Module

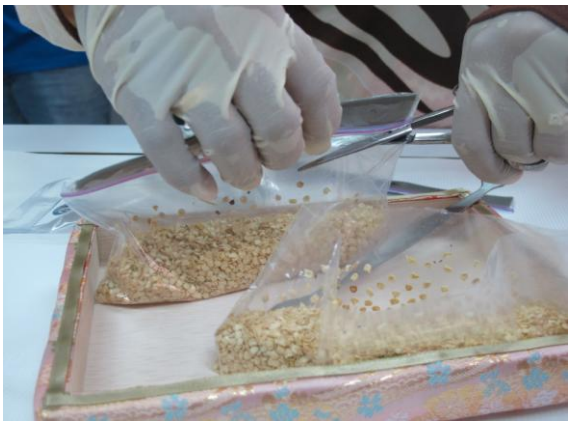
d. The seeds coming back home

After surviving the heat of the re-entry on STS 134 along with others astronaut, the seeds finally arrived in Malaysia on 15 July 2012. The seeds were received with warm welcome by all anticipating parties especially by the nuclear physicist who was most eager to have the 1st experiment being conducted before anyone else on radioactivity of the seeds.

Pic 8 : Agencies that eager to received the seeds

Pic 9 : Nuclear physicist having the 1st go at the seeds before anyone else.

After receiving the green light from nuclear physicists and Malaysia Quarantine and Inspection Services (MAQIS), the seed were then transported immediately to the quarantine side at Serdang. The seal was open at the quarantine side and a few samples were taken for further inspection during the growth of the plant which lasted for 5 month.



Pic 10, 11 & 12 :

Quarantine staff open the packaging

Pic 13 :
All the members present during the arrival of seeds at the quarantine site

The results from DOA and Nuclear Department test showed promising result with a confirmation that the seeds were free from radiation and safe to be released.

KFK1107012

Health Physics Group, Radiation Health and Safety Division,
Malaysian Nuclear Agency (Nuclear Malaysia)
Bangi, 43000 Kajang, Selangor Darul Ehsan.
Tel: 03-89250510 fax: 03-89112165

CERTIFICATE FOR RADIATION SCREENING

1. **COMPANY**: AGENSI ANGKASA NEGARA
   MOSTI
   PUTRA JAYA

2. **DATE OF MEASUREMENT**: 15 July 2011

3. **PERFORMED BY:**

   i) Name: Nazran Harun
   ii) Name: Mohd Hafizal Yusof

4. **DETAILS OF MEASUREMENTS:**

NO	EMS NO.	ITEMS	READINGS (cpm)	REMARKS
1	EG132326664JP	One Box (seeds from Japan)	20 - 60	FREE FROM CONTAMINATION

Note:
i) Background readings: 20 - 60 cpm.

AGENSI NUKLEAR MALAYSIA (NUKLEAR MALAYSIA) Kementerian Sains Teknologi & Inovasi Bangi, 43000 Kajang

Certified by

Khairuddin Mohamad Kontol
Manager
Health Physic Group
Malaysian Nuclear Agency

- This result is only valid for the related consignment and on the date of inspection

Pic 14 :
All Certificate from radiation screening from Malaysia Nuclear Agency

JABATAN PERTANIAN
(Department of Agriculture)
BAHAGIAN PERLINDUNGAN TANAMAN & KUARANTIN TUMBUHAN
(Plant Protection & Quarantine Division)
TINGKAT 1 – 3 , WISMA TANI
JALAN SULTAN SALAHUDDIN , 50632 KUALA LUMPUR
Telefon: 03-20301400 Fax: 03-26913550

Ruj Kami : JPPTK207/PKT/732/2 JLD 10 (61)
Tarikh : 21 Oktorber 2011

NATIONAL SPACE AGENCY
Level 8, PJH Commercial Building,
4011 Persiaran Perdana, Precint 4,
62100 Putrajaya.

Tuan,

KEPUTUSAN PENYARINGAN PEROSAK PADA SAMPEL / KONSAINAN YANG DIIMPORT
(Peraturan 10,11 dan 15 Peraturan-Peraturan Kuarantin Tumbuhan 1981)

Adalah dengan hormatnya saringan telah dibuat terhadap:

a)	**Sampel**	: Seeds- Sweet Pepper.
b)	**No Rujukan PQ**	: BAK 22/11
c)	**No Rujukan KSM**	:27092011
d)	**No Import Permit**	: JPK 141107006662011
e)	**Tarikh Terima Dari PEQ**	: 18 Oktober 2011
f)	**Nama Pengimport**	: National Space Agency.

2. Keputusannya ialah sampel bebas dari perosak kuarantin tumbuhan.

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

27 OCT 2011
PEJABAT KETUA PENGARAH ANCKABA

(MOHD RIDZUAN BIN ISMAIL)
Ketua Penolong Pengarah
Unit Perundangan dan Kuarantin Domestik, Seksyen Penguatkuasaan
Bahagian Perlindungan Tanaman dan Kuarantin Tumbuhan
Jabatan Pertanian.

s.k. i Ketua Unit Kuarantin Selepas Masuk (PEQ), Serdang.

ii Pintu Masuk MAQIS, KLIA, Sepang

Harap sebutan bilangan surat kami apabila menjawab

Pic 15 :
Approval letter from DOA of seeds free from pest and disease

e. Malaysia Space Seed Seeds handing over ceremony

A symbolic Malaysia Space Seed handing over ceremony from JAXA to Malaysia has been done on 10th October 2011 in conjunction with the 4th Anniversary of Malaysia Angkasawan Programme (SUPAN 4). ANGKASA we're glad to have Director of KIBO Utilization Office for Asia, Mr. Shigeki Kamigaichi and other representative from JAXA for the event. This ceremony was witnessed by Minister of Science, Technology and Innovation, Datuk Seri Panglima Dr Maximus Johnity Ongkili and other the ministries top management.

Pic 16 :
Mr Kamigaichi handing over the seeds to Director General of ANGKASA

f. Malaysia Space Seed Competition

The competition format was chosen because :-

i. To promote of microgravity science - space awareness;
ii. To develop student interest and skill in scientific space experiments and research;
iii. To compare, analyze and do hypothesis about the growth of microgravity environment – exposed seed compared to earth – grown seed.

This competition is open to all secondary school students in Malaysia. Schools are only allowed to send in one team comprises a maximum of 20 students supervised by 4 teachers. To get the best participation, the competition was announce on a few local newspapers.

Pic 17 :
The paper cutting of the competition

All interested schools were registered through the official website (https://astronomi.angkasa.gov.my/spaceseeds).

A total of 52 school had been registered to enter the competition. To kick-off this competition, a teacher representative each team are call for a briefing session in National Planetarium on 3rd April 2012. The competition will then begin in April simultaneously at all 52 schools. The student will working in a group and monitor the seed growing of the seed that been sent to ISS and the ground control seeds. Weekly

reports will be submitted through the website and ANGKASA will be monitoring their progress from there. In early August, all teams must submitted their full research report which will then be evaluated by the judges. Student have to make their presentation and conclude their findings and present it to the judges. The closing ceremony will be held in December 2012 in conjunction with Asian Pacific Space Agency Forum (APRSAF-19).

g. Malaysia Space Seed in Media