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Welcome to the latest edition of the International Cocoa Quarantine Centre (ICQC, R) Newsletter. In this issue, we report on the latest releases of accessions from quarantine, major refurbishment work that has taken place within the ICQC, R greenhouses and the availability of "GU" clones with disease resistance traits.

## Releases from Quarantine

A total of 18 accessions have been released from quarantine since the start of this year (details summarised in Table 1). Of particular note are a number of clones from the CFC/ICCO/Bioversity International Collection that were selected for superior yield traits and/or disease resistance. Additionally, two further "TARS" clones are now available (high yielding clones developed by USDA) and one Ucayali ("U") clone (a genetically distinct group from Peru).

The full clone list is available at:

<http://www.icqd.rdg.ac.uk/acquisition.php>

**Table 1:** Recent releases of accessions from quarantine, which are now available for budwood export.

Clone	Reading Accession number	Donor Genebank
B 13/5 [POU]	RUQ 1427	ICG, T
CRU 111	RUQ 1460	ICG, T
CRU 271	RUQ 1433	ICG, T
ICS 35	RUQ 1448	ICG, T
ICS 83	RUQ 1376	ICG, T
IMC 31	RUQ 1449	ICG, T
IMC 94	RUQ 1381	ICG, T
LCT EEN 261/S-4	RUQ 1452	ICG, T
LP 3/4 [POU]	RUQ 1377	ICG, T
LP 3/15 [POU]	RUQ 1501	ICG, T
LX 43	RUQ 1374	ICG, T
MOQ 6/95	RUQ 1436	ICG, T
NA 232	RUQ 1504	ICG, T
NA 807	RUQ 1457	ICG, T
TARS 14	RUQ 1389	USDA, PR
TARS 23	RUQ 1446	USDA, PR
TRD 85	RUQ 1442	ICG, T
U 45 [PER]	RUQ 1495	Peru

## Upgrading of the ICQC, R Greenhouse Facilities and the Installation of Energy Saving Measures

Since the beginning of this year, we have been upgrading the ICQC, R greenhouse facilities. This follows an award of a grant from the Dutch Cocoa Buffer Stock Fund of the Ministry of Agriculture, Nature and Food Quality of the Netherlands (LNV), co-funded by the Cocoa Research Association Ltd.

A key component of this refurbishment involved the installation of moveable thermal screens in all of the greenhouse facilities. These consist of industry-standard foiled material, suspended on a pulley system at a height of approximately 2.2 m. The screens operate automatically and are controlled via light sensors. During the day, the screens will close under sunny conditions, thus protecting the cocoa plants from excessive light but remain open during dull conditions. At night the screens close automatically thus reducing heat loss and therefore energy usage. During the summer months, the screens also help to reduce excessive temperatures.

The installation of these screens took place throughout this summer and was completed by October.

The project has also involved refurbishing a large (22 \* 15 m) double-span polytunnel greenhouse, providing a new home for a large proportion of the post-quarantine germplasm collection.

We are most grateful for LNV's support since impact of these refurbishments will be to contain running costs, reduce the "carbon footprint" of ICQC, R and to provide better environmental control within the facilities.

## Selected Removal of Accessions from the ICQC, R Collection

A number of accessions in the ICQC, R collection were identified as off-types a number of years ago and, as a result there has been little continued demand for them (see Table 2). We are therefore proposing to remove these from the Collection after April 2009. Additionally, we are scheduled to remove two accessions that are now very widely distributed. If any institute wishes to receive any of these clones, please let us know immediately as they will not be available after April 2009.

**Table 2:** Accessions scheduled for removal from the ICQC, R *In vivo* collection in April 2009

Clone	Accession number
PA 107 [PER]**	RUQ 35
RUQ 9 (MIS_GBRRUQ_IMC 14)	RUQ 9
RUQ 10 (MIS_GBRRUQ_IMC 20)	RUQ 10
RUQ 13 (MIS_GBRRUQ_IMC 67)	RUQ 13
RUQ 16 (MIS_GBRRUQ_IMC 96)	RUQ 16
RUQ 22 (MIS_GBRRUQ_POUND 4/A)	RUQ 22
RUQ 39 (MIS_GBRRUQ_PUCALA)	RUQ 39
RUQ 47 (MIS_GBRRUQ_SIAL 93)	RUQ 47
RUQ 1065 (MIS_GBRRUQ_SCA 19)	RUQ 1065
SAN MIGUEL 3360/3 [CHA]	RUQ 142

## Imports of New Material

The main focus for accessing new material into ICQC, R is currently clones that have been screened for resistance to witches' broom disease and black pod at the Cocoa Research Unit, Trinidad. Please contact us if there are any specific clones needed by your Institute that are not currently held at ICQC, R and we will endeavour to make the necessary arrangements for them to be imported.

## Availability of GU (French Guiana) Clones with Disease Resistance Traits

The ICQC, R collection contains a range of "GU" clones (originally collected from French Guiana). Research conducted by CIRAD and partners has revealed that a number of these clones exhibit a level of resistance to *Phytophthora palmivora*, *P. megakarya* and to witches' broom disease. *Phytophthora* resistance was determined by means of the leaf disc method<sup>1</sup> and witches' broom disease resistance by the spray test or the agar droplet test<sup>2</sup>.

**Table 2: List of GU clones with disease resistant traits that are available for budwood export from ICQC, R. Information provided by Philippe Lachenaud (CIRAD).**

Clone	P. <i>palmivora</i> (leaf test)	P. <i>megakarya</i> (leaf test)	WB test	WB on pods (field)	WB on shoots (field)
GU 114/P			R	MR	
GU 123/V	VR	VR			
GU 125/C		VR		R	
GU 133/C	VR				
GU 171/C					R
GU 175/P	MR		R		R
GU 195/V	R	VR			
GU 207/H	VR			R	
GU 219/F			MR	R	R
GU 221/C					R
GU 226/V	R	VR			
GU 241/V	R	R			
GU 261/P					R
GU 265/P					R
GU 269/V	R	R			
GU 277/G			R		R
GU 310/P				R	R

"VR" = very resistant, "R" = resistant, "MR" = moderately resistant

## Enquiries

Enquires or further information on ICQC, R and how to receive germplasm should be directed to: Andrew Daymond.  
[a.j.daymond@reading.ac.uk](mailto:a.j.daymond@reading.ac.uk).

## To Receive Budwood

Cocoa budwood is supplied free of charge. Please provide as much advanced warning of your requirements as possible and send us an import permit *at least two weeks* before the date of shipment. This should state that you wish to import cocoa as budwood and any treatment of the budwood required (e.g. pesticide and/ or fungicide treatment, if applicable). Please fax the permit to: 00 44 118 378 7468 or send as an e-mail attachment.

## Funding

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<sup>1</sup>Paulin, D., Ducamp, M. and Lachenaud, P. 2008. New sources of resistance to *Phytophthora megakarya* identified in wild cocoa tree populations of French Guiana. *Crop Protection*, 27, 1143-1147.

<sup>2</sup>Lachenaud, Ph., Paulin, D., Ducamp, M. and Thevenin, J-M. 2007. Twenty years of agronomic evaluation of wild cocoa trees (*Theobroma cacao* L.) from French Guiana. *Scientia Horticulturae*, 113, 313-321.