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MUNG CENTRAL

Editorial

It's the FAO International Year of the Pulse and all over the world people are celebrating the diversity and benefits of these wonderful foods! For centuries pulses have formed the basis of many culinary cultures, from beans in Central America to chickpeas in the Middle-East. It's only fitting then that we announce the launch of the International Mungbean Improvement Network (IMIN). The IMIN is a collaboration between the World Vegetable Centre (Worldveg), the Queensland Department of Agriculture and Fisheries Australia, the Pulses Research Centre of the Bangladesh Agricultural Research Institute (PRC-BARI), the Myanmar Department of Agricultural Research (DAR), and the Indian Institute of Pulses Research under the Indian Council of Agricultural Research (ICAR-IIPR), with funding from the Australian Centre for International Agricultural Research (ACIAR).

A lack of investment to date in breeding and improvement of key crops such as mungbean has resulted in production constraints in many countries. This is due to an inability of current varieties to cope with emerging pest and disease pressures, as well as seasonal variability. The IMIN will support partner institutions in breeding new mungbean lines expressing desirable traits for improved production both in the partner countries of the project and on a global scale, by organising access to broad germplasm, and putting in place Information Technology (IT) support for breeding.

In addition to breeding goals, the team is building on the international network that will spread the news about mungbeans and attract new members and investors to mungbean research. The network will coordinate to perform research resulting in the development and release of new mungbean varieties that are widely adopted and raise the profitability of smallholder farms and the sustainability of local production systems.

This newsletter has been launched in order to spread awareness of the IMIN as well as the profile of the vital, yet under recognized crop known as mungbean.

We hope you enjoy reading about our activities.



Ms. Shu-hui Chu (AVRDC Research Assistant) and Mr. Caleb Breria (PhD student from Papua New Guinea, currently studying at NPTUST, Taiwan and working at AVRDC) extract quality DNA from the mungbean mini-core collection for high throughput genotyping. Photo credit: Roland Schafleitner.

What we do

News from World Vegetable Centre, HQ, Taiwan- Molecular characterization of the mungbean mini-core collection

Contributed by Roland Schafleitner, Worldveg

The global genetic resources for mungbean are safeguarded in germplasm collections held at various institutions worldwide. The collections strive to be as large as possible to represent a maximum of the genetic diversity available for the crop. For example, the World Vegetable Centre mungbean collection consists of more than 8,000 accessions. It is laborious and logistically challenging to screen such large collections for the traits required for breeding better varieties. To improve the access to the trait diversity of mungbean, the Centre has generated a mini-core collection comprising 300 accessions selected to represent a large fraction of the available genetic resources for the crop. The mini-core collection has been distributed to Myanmar, Bangladesh, India and Australia for identifying agronomic traits that are useful for breeding. First experiments have resulted in accessions with increased salt tolerance and resistance to dry rot. More traits useful for breeding are about to come!

News from Queensland, Australia

Contributed by: Col Douglas, Queensland Department of Agriculture and Fisheries (DAF)

We have finished harvesting trials at my home base of Warwick, in southern Queensland, as well as trials on farmer co-operator properties. The Worldveg mini-core germplasm set has been released from post-entry quarantine and already sown to one of two winter (dry season) increases. The first of these is at Applethorpe, 50 km south of Warwick, which is a horticultural area famous for apples and stone fruit production, and it is officially the coldest place in the state of Queensland. Overnight minimum temperatures will fall to as cold as 10 degrees below zero over the winter months (July and August)! Our ACIAR mungbeans will be safely inside a heated glasshouse. The second increase will be sown much further north in warmer conditions, on a sugarcane farm north of Cairns and within sight of the Great Barrier Reef.

From both of these seed increases I hope to have enough seed to sow field trials in 2017 to evaluate yield and agronomic adaptation of the mini-core collection at sites in two of Australia's main mungbean growing regions. The Australian IMIN program will also evaluate the mini-core collection for our three main foliar diseases. These are halo blight (*Pseudomonas*), powdery mildew (*Erysiphe*) and tan spot (*Curtobacterium*).



Mungbean line growing in quarantine at DAF, Queensland, \$10 note shown for scale- long pods are important yield characteristic Photo credit: Col Douglas.



A group of farmers listening to voice SMS based crop advisory, Photo credit: Dr Aditya Pratap.

Other news from the Mungbean network

News from India: Technology Intervention Changes Fortunes of Mungbean Farmers in Northern Plains of India

Contributed by: Uma Sah, Narendra Kumar, Aditya Pratap, Sanjeev Gupta and N.P. Singh ICAR-Indian Institute of Pulses Research, Kanpur

Mungbean cultivation during the Summer season in Western and Central India is gaining momentum in recent years due to availability of short duration, high yielding and *Mungbean Yellow Mosaic Virus* (MYMV) resistant varieties. Summer mung bean cultivation requires specialized skills because of very high temperatures (reaching up to 44°C) during the crop growth stage, limited availability of water for irrigation and heavy insect-load, especially the beet army worm, thrips and white fly. The ICAR-Indian Institute of Pulses Research, Kanpur through its outreach programmes launched a programme to popularize the spring/summer mungbean cultivation in the region. In these efforts, complete package technology participatory demonstrations were undertaken in Kanpur Dehat, Kanpur Nagar, Fatehpur, and Jalaun districts of the region. Amongst other things, the Institute was able to provide the participating farmers with crop stage based technical know-how through voice based mobile advisories regarding infestation and management of insect-pests, irrigation scheduling and interculture operations. These voice based SMS advisories were regularly provided to more than 2300 farmers across the region covering the districts of Jalaun, Fatehpur, Chitrakoot, Hamirpur, Kanpur Dehat, Balia and Kanpur Nagar of Uttar Pradesh state. Consequently, the farmers could harvest mungbean crop that was rated as excellent by them with no incidence of yellow mosaic disease in improved varieties.



Researchers in mungbean experimental field, Myanmar.
Photo: Kyaw Swar Win.

Mungbean Cultivation in Bangladesh

Submitted by: A. K. M. Mahbubul Alam, Md Jahangir Alam, Pulses Research Center, Bangladesh Agricultural Research Institute

Mungbean is widely grown in Bangladesh and is also an important source of protein in Bangladeshi diets. Other pulses grown in Bangladesh include grasspea, lentil, Blackgram, chickpea, cowpea and pigeonpea. Usually mungbean grows in Bangladesh in the pre-winter (August-October) season. Research and development programs on mungbean have provided a break-through after the development of photo and thermo insensitive varieties. Such varieties flower at a given maturity rather than requiring temperature or day length to initiate their reproductive phase. During the 2007-8 to 2014-15 seasons, the area planted with pulses and the production of pulses has increased. This is due to the development and release of higher yielding, disease resistant and short duration mungbean varieties. This has made mungbean a suitable crop to be integrated into existing rice-wheat and rice-rice systems.

Mungbean occupies about 24% of the total area under pulse production in Bangladesh. This represents the second highest area after grasspea. Mungbean is currently being cultivated after the harvesting of rabi (winter) crops such as wheat, mustard, and lentil. Cultivation is mainly concentrated within the Gangetic flood plain in the northern districts and some areas of the southern districts. After the development of photo and thermo insensitive varieties, mungbean in Kharif-I (summer) season has been successfully introduced into the lentil/wheat/mustard-mung-T aman rice cropping systems in the northern and western districts of the country.

Of the 20 improved mungbean varieties that have been released to date, the Bangladesh Agricultural Research Institute have released eight varieties for cultivation in Bangladesh. From those eight varieties, BARImung 6 is the most popular among farmers. BARImung6 takes about 55 to 60 days to reach maturity and is resistant to two major diseases; *mungbean yellow mosaic virus* (MYMV) and cercospora leaf spot (CLS).

News from Myanmar

Contributed by: Kyaw Swar Win and Tun Shwe, Department of Agricultural Research

Mungbean is an important rotation crop for rice farmers in Myanmar. Mungbean has both a higher net revenue (3.5 times higher) and cash income (1.4 times higher) than paddy rice production. Rice production is therefore less profitable for smallholders, and farmers depend increasingly on mungbean as a rotation crop for cash income. In contrast to its neighbouring countries in South Asia, Myanmar has a strong international presence as an exporter of high quality mungbean. The crop is mostly grown during and after the monsoon season on about 1.12 million ha, with a mean yield of about 1.29 t/ha (range from 0.44 t/ha in Taninyharyi to 1.67 t in East Bago).

The team at the Department of Agricultural Research in Yezin and Tatkone (central Myanmar), and Magway (central dryzone) have already multiplied the mini-core collection and have commenced preliminary evaluation in research farms at Yezin, Magway and Tatkone.

Stay tuned for more news on the progress of the mini-core.



Future Newsletters

The IMIN aims to publish a semi-regular newsletter and is now calling for submissions for the next edition. Please email Miriam.McCormack@aci.gov.au to submit articles or for further information on the newsletter.

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Sweet Mungbean Soup Recipe

Contributed by Roland Schafleitner from Worldveg, Taiwan

Sweet mung bean soup (綠豆湯 -lu dou tang) is a popular summertime dish in Taiwan. Chinese medicine suggests that mungbeans have a cooling effect on the human body, therefore a cool mungbean soup should make us feel better on hot and humid summer days. Admittedly, sweet mungbean soup does not look very attractive, but it tastes really good. And it is so simple to prepare!

Recipe

1. Soak the beans in water for 2 hours, drain.
2. Add 300 g mung beans to 2 l of water, bring to a boil, reduce heat, cover and simmer for 1h.
3. Once the mung beans are soft, add 200 g of brown sugar, stir to dissolve. Let it cool down.
4. Serve cold and enjoy!



Staff feature From Australia

Submitted by Col Douglas

Valeria Paccapelo has joined the Biometry team of the Department of Agriculture & Fisheries (DAF) at Toowoomba, Queensland in March 2016 and will provide statistical support for the International Mung bean Improvement Network and Australia's National Mung bean Improvement Program. After completing a Bachelor and Masters in statistics in Argentina, Valeria worked for 3 years as a biometrician for the Advanta Seeds sunflower breeding program with focus on association mapping and genomic selection. Later, as a data manager for the Monsanto maize breeding program for 4 years.

Project News & Events

Fortnightly skype meetings

Since the formal launch in February of this year, the International Mungbean Improvement Network (IMIN), has been able to hold a skype meeting on a fortnightly basis to discuss project progress and outputs. This has helped the various partners stay in contact across borders.

Annual meeting Nov. 2016

The next meeting of the IMIN will be the annual meeting, this year held in New Delhi, India in November just prior to the International Pulses Conference. All project partners will be attendance for face to face discussions.