PLANT BREEDING NEWS

EDITION 240

November 2012
An Electronic Newsletter of Applied Plant Breeding

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Sponsored by GIPB, FAO/AGP and Cornell University's Department of Plant Breeding and Genetics

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1 NEWS, ANNOUNCEMENTS AND RESEARCH NOTES

1.01 **Pressure on breeders to crack yields ceiling - Yield ceiling becomes the breakthrough must**

November 2, 2012
Australia

An increase in the number of frosts and a later frost season means more and more growers are having to reassess their sowing dates and varieties It is a cruel paradox that although Australia's climate is warming, the number of frost days and the length of the frost season are increasing across much of the Australian grainbelt.

CSIRO climate application scientist Dr Steven Crimp has been studying the incidence of frosts across the grainbelt between 1960 and 2011. "Observational data shows that the incidence of frosts has increased in Australia and there have been shifts in frost occurrence to later in the year," he says.
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"So even though we have a warming trend, we have this unexplained change in frost risk. In the east, the window of frost occurrence has broadened, so frosts are occurring earlier in the season and much later in the season. As we move to the west there is less occurrence of earlier frosts and it is more of a shift to frosts later into the season."

The frost window has lengthened by three weeks in the Victorian grainbelt and by two weeks in the New South Wales grainbelt. Western Australia has, statistically, remained the same, while eastern South Australian sites are similar to Victoria, and sites in the west of SA are more like WA.

Dr Crimp says frost risk is estimated by using Bureau of Meteorology (BoM) temperature data, using a threshold of 2°C. "A measurement of 2°C, registered in the standard Stevenson screen, which is at head height, amounts to a surface temperature of around zero, or freezing, at ground level."

His team found the frost window over much of northern Victoria had lengthened considerably in the decade to 2011. "If you look at the risk of experiencing a 2°C minimum temperature event, the 10 per cent risk now occurs 46 days later than in any of the previous decades. The frost window over this past decade has been much wider than farmers have experienced before."

The consequences of a late frost for grain growers can, of course, be devastating. "A grain crop is particularly sensitive at grain fill, and there has been anything from a 40 to 80 per cent loss when frosts occur."

Dr Crimp and his colleagues conducted a detailed simulation of frost risk in 17 Victorian locations.

“Northern Victoria seems to be the epicentre of this change in frost occurrence. We used our model to calculate across the entire record of climate that we have, from 1960 to the present.”

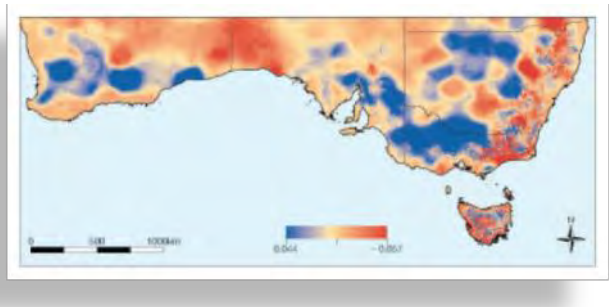

Figure 1 - Frost days index per time period August to November trend; 1961 to 2010 Trends in the number of frost events (temperatures below 2°C) for the period August to November (1961 to 2010) based on the BoM high-quality gridded minimum temperature dataset. Regions coloured in blue represent areas of increasing frost number and areas depicted in red indicate declining frost number. The legend values represent the change in number of events per month, per year. SOURCE: ECAFD Index

Because growers can manage frost risk by changing the planting date and using faster or slower growing varieties, the researchers have sought to inform these decisions by examining the interaction between sowing and flowering dates for three widely used wheat varieties in northern Victoria: the early flowering Axe, mid-season variety Yitpi and the late-maturing Rosella.

Using APSIM (the crop model behind Yield Prophet®) they ‘planted’ each variety each week from 1 April (day 90) to 15 July for the period 1960 to 2011. They calculated a mean flowering date for each sowing date for the three varieties across the 17 locations. The time of flowering was then graphed against the risk of frost.
For the Birchip site, Dr Crimp said 90 per cent of the frosts occurred at, or before, day 240 (27 August).

“Ten per cent of frosts occur after day 290 (16 October). If I am a risk-averse farmer, and I want to avoid all but 10 per cent of the frosts that may occur, I would have to plant on day 170 (18 June) for early maturing, day 160 (8 June) for medium, and day 150 (29 May) for late.”

Dr Crimp notes that many growers prefer to dry sow on a certain calendar date, which he says could make those crops more vulnerable to frost risk if sowing dates do not take into consideration the changing frost risk.

His team found decadal differences. For example in 2001 to 2011 frost days occurred between 20 to 46 days later than in the 1950s.

Dr Crimp says many people thought the increase in frosts was due to dry conditions, but the past decade has included some very wet years.

To try to find an explanation, the research project has used hourly, three-hourly and daily climate data to look for links between synoptic patterns, or for large-scale climate patterns that can be associated with frost events.

Dr Crimp says researchers' attention is focused on the subtropical ridge*, its change in intensity and displacement south, as well as the increase in the frequency and intensity of blocking highs.

"As these synoptic features are displaced further south, they bring masses of very, very cold air over the country." He says this so-called 'southward displacement' is what researchers think is driving these changes, particularly for the later frost occurrences.

Next, Dr Crimp and his colleagues want to look at whether the southward displacement is a temporary change or whether it is likely to continue. They also hope to be able to build a forecasting system.
www.grdc.com.au/GCTV

Steven Crimp, Mike Pook, David Gobbet, Nirav Khimashia, Alison Laing and Uday Nidumolu, *Understanding frost risk in a variable and changing climate*
*The subtropical ridge is a belt of high pressure situated around 30 degrees latitude. It is responsible for trade winds and the westerlies. It can be displaced by the ENSO climate cycle, with a subsequent impact on monsoon regimes.

http://www.seedquest.com/news.php?type=news&id_article=31572&id_region=&id_category=&id_crop=

Source: GRDC via SeedQuest.com

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1.02 **Agricultural R&D spending on the rise, but low-income countries continue to lag behind**

Washington D.C., USA
October 25, 2012

Global challenges, including the recent food and financial crises and climate change, highlight the need for continued and scaled-up investments in agricultural research and development (R&D). The report ***ASTI Global Assessment of Agricultural R&D Spending***, published by the International Food Policy Research Institute's (IFPRI)

Agricultural Science and Technology Indicators initiative (ASTI) and the Global Forum on Agricultural Research (GFAR), reveals trends in R&D spending from 1981 to 2008. Following a decade of slow growth in the 1990s, global public spending on agricultural R&D increased by 22 percent from 2000 to 2008—from $26.1 billion to $31.7 billion. These numbers, however, only tell part of the story. Middle-income countries have been the main drivers of global growth in recent years. China and India accounted for nearly half the global increase, but spending also rose significantly in a number of other more advanced developing countries, including Argentina, Brazil, Iran, Nigeria, and Russia. Growth was particularly strong from 2005 to 2008. Most notably in Brazil and China, long-term government commitment to agricultural R&D and a supportive policy environment have fueled increased agricultural productivity, as well as overall economic growth. This demonstrates the benefits of sustained government investments.

Agricultural research spending in low-income countries, on average, grew by 2 percent per year from 2000 to 2008, with spending in many countries stagnating or declining. A large number of low-income countries, particularly in Africa south of the Sahara, are highly vulnerable to volatile research funding, often the result of the short-term, project-oriented nature of donor and development bank funding. Additionally, many R&D agencies in these countries lack the necessary human, operating, and infrastructure resources to successfully develop, adopt, and disseminate science and technology innovations. "More attention should be given to the world's poorest countries regarding government and donor support," said Nienke Beintema, Head of the ASTI initiative at IFPRI. "We need to prevent them from falling further behind."

The report is released in advance of the Second Global Conference on Agricultural Research for Development (GCARD), a platform to encourage practical collaboration among all those working in agricultural research and innovation and their role in development, which opens on October 28 in Punta del Este, Uruguay.

"We are very concerned that unless spending increases dramatically, smallholder farmers in the poorer countries will continue to lack the essential knowledge, tools and technologies required to support their needs, and for production to be resilient in the face of the challenges ahead," said Mark Holderness, Executive Secretary of GFAR and organizer of GCARD. "This study provides a key first step in creating the robust evidence base required to demonstrate the essential value of such investments and convince governments and societies of the returns they bring."

The full report and additional information can be found online here:
http://www.ifpri.org/pressroom/briefing/global-trends-agricultural-rd-spending
The International Food Policy Research Institute (IFPRI) seeks sustainable solutions for ending hunger and poverty. IFPRI was established in 1975 to identify and analyze alternative national and international strategies and policies for meeting the food needs of the developing world, with particular emphasis on low-income countries and on the poorer groups in those countries. It is a member of the CGIAR Consortium.

The Global Forum on Agricultural Research (GFAR) is a multistakeholder-led initiative that serves as an open and inclusive forum for dialogue and action on strategic issues in agricultural research and development (R&D). It facilitates and promotes cost-effective partnerships and strategic alliances among agricultural R&D stakeholders in their efforts to alleviate poverty, increase food security, and promote the sustainable use of natural resources.

More news from: . CGIAR (Consultative Group on International Agricultural Research) . IFPRI (International Food Policy Research Institute)

http://www.seedquest.com/news.php?type=news&id_article=30850&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.03 **Luther Burbank's legacy on display**

November 2, 2012

Janny Hu

The Santa Rosa home of famed horticulturalist Luther Burbank (1849-1926), developer of hundreds of plant varieties, is now a city park and museum.

He'll never be as famous in popular culture as his friends Thomas Edison or Edsel Ford, but you can't fault Luther Burbank for that. Breeding plants just isn't as sexy as engineering incandescent light bulbs or next-generation cars.

One of the pre-eminent horticulturalists in American history, Burbank developed more than 800 varieties of fruits, flowers and vegetables over his career, including the russet potato, the most widely cultivated in the country.

It's also the potato most often used to make french fries, and that's just one of the Burbank trivia bits you'll encounter while tracing his life and works through former residences in Sonoma County, where he lived from 1875 until his death in 1926.

Today, the Luther Burbank Home & Gardens is a 1.6-acre city park, a historic downtown landmark that sits across from City Hall and Juilliard Park in downtown Santa Rosa.

It's here that I met Barbara, one of the volunteer docents who leads guided tours between April and October. (A self-guided audio tour, conducted via visitors' own cell phones, is available year-round and covers much of the same information for the garden and grounds.)

Barbara and I started off in the gardens, which essentially double as a living museum to Burbank's plant wizardry. It includes the paradox walnut tree that Burbank created in hopes of achieving a fast-growing hardwood tree - hence, the paradox.

Nearby is a plumcot tree, a cross between a plum and apricot. The difference between a plumcot and a pluot? The plumcot has the fuzzy skin of an apricot.

Soon, we came to a potato bed, a significant marker, Barbara says, because the potato financed Burbank's trip west.

The Massachusetts-born lad, born in 1849, was the second-youngest of 15 children and a rather sickly child, so he was often at home, following his mother around the garden.

Forced to help support the family when his father died, Burbank bought a plot of land and began farming, developing the Burbank potato, a precursor of the russet.

Eventually, he sold the rights to the potato and farm for $150, enough to buy a ticket on the transcontinental railroad and start life anew in California.

"Nine days," Barbara says of the journey west. It wasn't long before Burbank and his plants began flourishing. Inspired by Darwin but with only an elementary school education, Burbank didn't practice traditional scientific methodology.

Records of his cross-breeding, hybridization and grafting efforts are spotty at best. In many cases, results that were successes were simply denoted with an 'X' - examples of which can be seen in his greenhouse.

Burbank managed to develop more than 100 varieties of stone fruit, including the Santa Rosa plum, freestone peach and plumcot. He also spent 20 years trying to develop a spineless cactus that cattle could eat and that would be drought-resistant, a project that was ultimately unsuccessful.

Most of Burbank's work was conducted at his 18-acre Gold Ridge Experimental Farm in Sebastopol, where he sometimes stayed overnight.

But "home" was officially in Santa Rosa, and a walk through the Greek revival cottage reveals family keepsakes and furniture, as well as the colored glass and hand-painted tiles beloved by Burbank's second wife, Betty Burbank. There are family photos and photos of famous friends, including Ford, Edison and Helen Keller.

Although the Burbanks moved into a larger home in 1906, the much younger Betty Burbank returned to the cottage upon her husband's death in 1926, remaining there until her own death more than 50 years later.

The floors creak and the things are as they were in Betty Burbank's final years - except in the kitchen, where the antique icebox and Wedgwood stove were moved in to keep the interior consistent with Luther Burbank's era. Betty Burbank, having outlived her husband by a half-century, had upgraded to modern appliances by the time of her death.

By prior agreement, the Burbank estate was turned over to the city of Santa Rosa when Betty Burbank died, and both she and Luther Burbank are buried on the property.
Though the guided tour season is over, there's still a chance to see the whole property this year, when the Luther Burbank Home & Gardens' 33rd annual Holiday Open House takes place the first weekend of December.

Luther Burbank Home & Gardens: 204 Santa Rosa Ave., Santa Rosa; (707) 524-5445. E-mail: burbankhome@lutherburbank.org. Gardens open 8 a.m.-dusk daily. Entrance is free. Self-guided audio tours, via cell phone, are also free. Annual Holiday Open House is Dec. 1-2, 10 a.m.-4 p.m. Admission is $2. Public tours of garden, home, greenhouse and Carriage House Museum run April through October, 10 a.m.-3:30 p.m. Cost is $7 for adults; children 12 and under are free.

The Gold Ridge Experimental Farm: 7781 Bodega Ave., Sebastopol; (707) 829-6711. Open for self-guided tours year-round, with docent tours available by appointment. Plant sales every Wednesday, 9 a.m.-noon.

http://www.sfgate.com/food/article/Luther-Burbank-s-legacy-on-display-4003674.php

Source: SeedQuest.com

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1.04 **Agribusiness: Drought tolerance, nematode resistance are breeding targets**

Penton Business Media

Monsanto's cotton breeders are looking for cotton lines that will perform better than traditional varieties under limited water regimes, especially in the often arid conditions of the Southwest.

Breeders also hope to develop cotton varieties with resistance to both the rootknot and the reniform nematode. "We need them now," says Darren Jones, Rolling Plains cotton breeding lead for Monsanto.

Jones, in an interview at a recent Deltapine field day near Idalou, Texas, said some breeding work shifted over the past few years to address the significant acreage in the Texas High Plains and Rolling Plains that is considered to count on "limited water." As much as 85 percent of the High Plains and 90 percent of the Rolling Plains qualify for that condition.

Monsanto opened its Texas Cotton Breeding and Technology Center in 2010. "Deltapine leadership has gotten behind us," Jones said. "They see the value in this breeding work, and we are excited about what we hope to find. We are exploring all the Deltapine germplasm and looking for those that fit in a light water environment."

He said the work has made progress. "We have found some varieties that will perform – still, we're always looking for more tests over a broader scale. In the next two or three years, we hope to have material that fits this market."

For the time being, Jones and another breeder out of Lubbock are looking at the germplasm currently on hand. "The High Plains breeder and I have made specific crosses, based on a limited amount of data and material to find specific genotypes," Jones said.

"We have crosses in development that we think will produce promising material, and we're looking for the exact mechanics that help these varieties perform."

At some point, Jones expects to take the breeding work and merge it with biotechnology to provide the herbicide and insect packages currently available to producers. "We want to get the best genetics with the best biotechnology," he said.

The nematode project includes breeders in Texas and the Mid-South. "We're looking at rootknot and reniform nematode resistance," Jones said. "Rootknot is the main focus in Texas." Nematode infestation is not a problem north of Lubbock, Jones said. "The area with sandier soils south of Lubbock is the target area."

"He said some promising material, with a B2RF background, will be in New Product Evaluator (NPE) varieties in 2013, and therefore may be ready for commercial launch in 2014 or 2015."

http://www.equities.com/news/headlinestory?dt=20121025&val=637025&cat=material

Source: SeedQuest.com

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1.05 **USAID supports CIMMYT-led partnership for heat resilient maize in South Asia**

October 25, 2012
Mexico City, Mexico

CIMMYT announced today that the U.S. Agency for International Development (USAID) will support a partnership to develop heat resilient maize (corn) for South Asia. The project will fall under Feed the Future, the US Government's global hunger and food security initiative, and is a partnership led by CIMMYT, involving Purdue University, Pioneer Hi-Bred, and several private sector and national research partners in South Asia.

Demand for maize in South Asia is increasing significantly due to an array of factors, including changing diets and a rapidly growing poultry sector. Maize yields in the major maize-growing South Asian countries (India, Pakistan, Nepal and Bangladesh) are still below 3 tons per hectare (FAOSTAT, 2011). "Out of a total of approximately 6 million hectares of hybrid maize grown in South Asia, nearly a million hectares are highly vulnerable to high temperature stress especially during flowering," said BM Prasanna, Director of CIMMYT's Global Maize Program.

"Nearly 80 percent of maize growing area in this region is rain-fed and highly vulnerable to extreme weather events, including drought and high temperatures. At the same time, spring maize has become an important option for intensifying and diversifying cropping systems in South Asia, especially in the upper and middle Indo-Gangetic plains, but the crop is prone to severe heat stress as well."

CIMMYT, in partnership with the national programs, has been successful in developing drought, low nitrogen or waterlogging stress tolerant maize germplasm suitable for diverse agro-ecologies. However, very little work has been done so far on understanding the physiological and molecular mechanisms associated with heat stress tolerance in maize, and few heat stress tolerant maize cultivars have been developed or deployed. Maize varieties with resilience to key abiotic stresses, especially water deficit and high temperatures, will play an important role in adaptation of the South Asian maize farming communities, especially the smallholders, to the changing climate.

The CIMMYT-led project on "Heat stress resilient maize for South Asia through a public-private partnership" (abbreviated as "HTMA" for "Heat Tolerant Maize for Asia") has been recently granted by USAID for five years (2012-2017) and US $3,786,080, with matching in-kind support by the public-private alliance. The project brings together public and private institutions based in South Asia with required expertise and complementary strengths. HTMA Project aims to build on the elite, abiotic stress tolerant maize germplasm base of CIMMYT; the technical expertise of key resource partners (CIMMYT, Purdue University and Pioneer Hi-Bred) for applying innovative technologies for accelerated development of climate resilient maize germplasm; the maize breeding and phenotyping locations and strengths of the NARS partners from

four target countries in South Asia (India, Nepal, Bangladesh and Pakistan); the seed production capacity, strong linkages to the farming communities, and the market reach of the private sector partners (Pioneer Hi-Bred, Vibha AgriTech, Ajeet Seeds and Kaveri Seeds), for developing and deploying heat stress resilient, high yielding maize hybrids with potential impact on the maize-dependent and climate change vulnerable regions in South Asia.

About the Feed the Future Initiative The Feed the Future Initiative was established after renewed international commitments to global agriculture made at the 2009 G8 Summit in L'Aquila, Italy. So far, Feed the Future has helped 1.8 million food producers to adopt improved technologies or management practices that can lead to more resilient crops, higher yields, and increased incomes. The initiative has also reached nearly 9 million children through nutrition programs, which can prevent and treat undernutrition and improve child survival. Harnessing scientific innovation and technology in agriculture and nutrition is key to reaching Feed the Future's core objectives of reducing global hunger, poverty and undernutrition. It is also critical to meeting the global challenges of producing more food with less land and water, improving nutrition, and helping farmers adapt to climate change. Investments under the Feed the Future Research Strategy range from longer-term research to address major global challenges to applied and adaptive research guided by host-country priorities for nearer-term impact.

About CIMMYT Headquartered in Mexico, the International Maize and Wheat Improvement Center (known by its Spanish acronym, CIMMYT) is a not-for-profit agriculture research and training organization. The center works to reduce poverty and hunger by sustainably increasing the productivity of maize and wheat in the developing world. CIMMYT maintains the world's largest maize and wheat seed bank and is best known for initiating the Green Revolution, which saved millions of lives across Asia and for which CIMMYT's Dr. Norman Borlaug was awarded the Nobel Peace Prize. CIMMYT is a member of the CGIAR Consortium and receives support from national governments, foundations, development banks, and other public and private agencies.

http://www.seedquest.com/news.php?type=news&id_article=30878&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.06 **Rice of the future gets financial boost**

The Philippines
November 5, 2012

The pursuit to rein in hunger with the development of a "cutting-edge" rice of the future has received a financial boost, and is now rolling into its second phase.

Led by the International Rice Research Institute (IRRI), the project seeks to create "C4 rice" – rice with a built-in fuel injector to better convert sunlight into grain,

potentially resulting in up to 50% higher production all while using less water and nutrients.

The Bill & Melinda Gates Foundation (BMGF), the UK government, and IRRI have put $14 million behind C4 rice over the next three years.

“This is exactly the sort of innovative scientific research that the Prime Minister was calling for at the Hunger Summit at Downing Street earlier this year,” said the UK Parliamentary Under-Secretary of State for International Development Lynne Featherstone. “Rice is the staple food for millions across the developing world, so finding a way to double the amount each plant produces would help to feed many more of the very poorest. This new funding will enable the International Rice Research Institute to begin producing prototypes of this ‘super rice’ for testing. This could prove a critical breakthrough in feeding an ever-growing number of hungry mouths.”

C4 rice research, currently in its early phases, hopes to develop a new type of rice with improved photosynthesis capacity, known as C4. There are classes of plants known as “C3” and “C4” – referring to how they convert light energy into sugar or photosynthesize. Rice has a C3 photosynthetic pathway. C3 photosynthesis is inefficient at converting inputs to grain, as opposed to the C4 pathway, in which resources are processed more efficiently and converted into higher grain production.

“Other plants, such as maize, already have C4 photosynthesis,” says IRRI’s Dr. Paul Quick, coordinator of the C4 rice project that brings together 17 research institutes worldwide.

“We want to incorporate this natural energy booster into rice, which usually just has C3 photosynthesis, so that it can achieve much higher yields,” he added. “It’s important to incorporate C4 in rice because rice grows in places where other crops such as maize do not grow and because rice is the staple food of more than half the world, including many people who live in poverty.”

The researchers have already identified crucial genes needed to assemble C4 photosynthesis in rice, defined the basic elements required for functional C4 photosynthesis, and successfully introduced 10 out of the 13 genes needed for C4 rice.

In this second phase of the project, the team aims to produce C4 rice prototypes for testing. “We’re thrilled to be working with the world’s elite in photosynthesis research to uncover genetic secrets and understand biochemical processes to bring rice to a new yield frontier,” concludes Dr. Quick.

The C4 rice project was first funded by BMGF and IRRI in 2009. The UK government has joined the second phase of the project and provided additional funding. Other donors are the European Union’s “3 to 4” project (the project Plant Photosynthetic Efficiency: from C3 to C4 system) and the CGIAR Canada Linkage Fund through a collaboration between IRRI and the University of Toronto.

Members of the C4 rice research consortium are Partner Institute for Computational Biology (China), University of Cambridge (UK), Oxford University (UK), Heinrich Heine University of Düsseldorf (Germany), Commonwealth Scientific and Industrial Research Organisation (Australia), Washington State University (USA), University of

Toronto (Canada), University of Sheffield (UK), Academia Sinica Taiwan (Taiwan), Donald Danforth Plant Science Center (USA), University of Minnesota - Minneapolis Campus (USA), Australian National University (Australia), James Cook University (Australia), University of Nottingham (UK), Cornell University (USA), and Kyung Hee University (South Korea).

http://www.seedquest.com/news.php?type=news&id_article=31144&id_region=&id_category=&id_crop=

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1.07 **Climate change could hit crops far worse than thought**

New Delhi, India
November 7, 2012

by Archita Bhatta

The impact of climate change on key food crops in Africa and South Asia may be much worse than previously estimated — with reductions of up to 40 per cent by the 2080s — according to a study, which synthesised results from related studies published over the last 20 years.

It also identified "major gaps in climate change impact knowledge" for certain crops and regions, such as central Africa. Such lack of knowledge could hamper effective adaptation policy decisions, it warns.

The study projects an eight per cent average decrease for all crop yields — and this figure increases to 40 per cent in worst-case scenarios. In Africa, the most significant yield reductions are predicted for maize, millet, sorghum and wheat, while in South Asia, maize and sorghum will be hardest hit.

The study looked at more than 1,140 publications that have projected the impact of climate change on eight key food and commodity crops (rice, wheat, maize, sorghum, millet, cassava, yam, and sugarcane) that together account for more than 80 per cent of total crop production in the two regions, and then analysed 52 of those studies in depth.

The strength of evidence on how severe the impact will be differed for different crops and regions. In Africa, just six out of 162 observations from the scientific publications analysed were about rice, yam and sugarcane, despite these accounting for almost a third of Africa's cropped area. The study says that that the development of new crop varieties and uptake of new technologies — the most costly adaptation options — are likely to bring the most benefits.

But since these will require substantial investment from farmers, governments and development agencies, "it is vital that any policy decisions to support their

implementation, particularly aid investments, are informed by a synthesis of best available evidence and not distorted by single studies".

"We need to ensure as much evidence as possible is gathered on the impact of climate change before making decisions on how to move forward," said Jerry Knox, lead author of the study and a researcher at Cranfield University, United Kingdom, in a press release.

The findings have led some Indian researchers to question whether India's National Mission on Sustainable Agriculture (NMSA) will be sufficient to cope with the predicted impacts of climate change.

"The whole agenda [of NMSA] is dictated by production enhancement for national food security which is likely to push agriculture practices against the environment and create more complex problems," said Rajeshwari Raina, a scientist at the National Institute of Science Technology and Developmental Studies.

She added that greater priority should be given to help small farmers adjust to such conditions and to neglected areas like coastal agriculture.

But Pramod Aggarwal, regional programme leader for the CGIAR research programme on Climate Change, Agriculture and Food Security, said that most climate impact projections do not account for the steps scientists and governments are taking to combat the effects of climate change, such as breeding new crop breeds.

He added that projections which do not account for interventions will always project incorrect scenarios.

http://www.seedquest.com/news.php?type=news&id_article=31170&id_region=&id_category=&id_crop=

Source: *Source: SciDev.Net*

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1.08 **China's corn revolution promises great leap forward in yields**

November 11, 2012

By Niu Shuping and Naveen Thukral

BEIJING/SINGAPORE, Nov 12 (Reuters) - China's farmers are using higher-yielding seeds and embracing modern technology in a shift that makes it less likely China will be a long-term major corn importer.

Record Chinese imports of 5.5 million tonnes in 2011-12 helped drive up benchmark Chicago corn prices to $8 a bushel earlier this year - more than double the average of the past decade - and raised the prospect of the world's second-biggest consumer becoming dependent on big overseas purchases.

But the government, which has always pushed for self-sufficiency in what is also the world's No.2 corn producing nation, has approved the use of more hybrid seed varieties and given more money to state farming institutions.

With new hybrid seeds, some farms in China's northeastern grain belt are already matching corn yields in the U.S. Midwest, around double the average Chinese production of 5 tonnes per hectare.

China's corn crop is forecast at a record 200 million tonnes this year, according to the U.S. Department of Agriculture, and imports are expected to tumble.

"My view is that within the next 7-10 years the gap in terms of demand and supply will probably be reduced to close to zero if the technology can reach the farmer," said Diego Diz, China corn marketing lead for Monsanto.

A sizeable reduction in China's imports could leave big exporters such as the United States and Argentina with no ready alternative outlets, analysts said, as there's little or no growth in demand elsewhere.

"China might not emerge as a major corn importer given efforts to boost yields," said Abah Ofon, a commodities analyst at Standard Chartered. "But they'll remain opportunistic buyers, taking U.S. corn as and when the price is low."

More intensive

Seed firms such as Monsanto Co, DuPont Pioneer, Syngenta AG and their Chinese joint venture partners are set to roll out more drought-, pest- and weed-resistant hybrids, with a focus on tougher stalks and roots needed for mechanised harvesting and more intensive planting.

Better management of pests and weeds, which can cost up to a fifth of the crop, is boosting yield gains, said Diz, adding that teaching farmers not to harvest their corn too early could boost yields by another 7-10 percent.

"China's corn farming practice is at a turning point," said Haiquan Zhang, chief China representative of Germany-based KWS SAAT AG, one of the world's top plant breeding firms.

The scale of China's challenge to meet surging demand for meat, and the corn to feed the animals, is enormous.

"Over the next 15 years, China needs 80-100 million tonnes of corn, additional corn, a year," said Hardeep Grewal, Syngenta's head of corn marketing for Asia-Pacific. "It means yields have to go up 50-60 percent."

Farmers in Heilongjiang, which borders neighbouring Russia, have expanded their corn fields further north, helped by seeds that mature early, offering high yields in a shorter growing period, local farmers said.

"There are better returns from corn and farmers are willing to invest more in machinery," said Zhou Changchun, a technician from Gongqing farm. "Corn output in the past 4-5 years has started to pick up, thanks to early matured seeds."

Mind the (yield) gap

DuPont Pioneer's Xianyu 335 hybrid seed has proved popular in the region, said farmers and a Beijing-based U.S. grains industry official, who noted that early planting yielded 10-20 percent more than other hybrids.

Hybrid Yunrui 8, which has resistance to ear rot and storage pests and performs well under drought, yields about 7.5 tonnes per hectare, said B.M. Prasanna, director of the International Maize and Wheat Improvement Center's global maize programme.

The Mexico-based centre is closely working with Chinese seed firms and state agricultural institutes, drawing on a gene bank of 27,000 samples of domesticated and wild corn varieties.

Yunrui 47 can yield up to 14 tonnes per hectare under high-density planting, according to Fan Xingming, Director of the Yunnan Academy of Agricultural Sciences, right at the top of U.S. corn yields.

Hybrids have modernised planting as some seed firms guarantee 95 percent germination, meaning farmers no longer have to place 2-3 seeds per hole, hoping at least one germinates.

"These seeds are revolutionary for China, and are welcomed by farmers even with higher prices," said the U.S. official, who didn't want to be named as he is not authorised to talk to the media.

Crop density, which has a direct impact on production, is up by around half to 60,000 plants per hectare from five years ago, but still lagging the U.S. level of around 80,000.

New varieties also mean reduced fertiliser use, and improved water efficiency - a critical factor in the increasingly water stressed northeast. By 2025, much of China's northeast will become either severely or extremely water stressed, according to the Aqueduct Water Risk Atlas managed by the World Resources Institute in Washington.

Water shortage was one factor cited by China's agriculture minister on Friday as a threat to the country's ability to feed itself, along with growing land and labour shortages.

"To ensure grain security...We will breed a new type of agricultural player and develop proper-scale mechanised farming," Han Changfu said at a session of the ruling Communist Party congress.

As is often the case in China, where there is progress, there is potential profit - for counterfeiters.

"There are a lot of fakes out there - most are just buying cheap seeds and putting them in fancy packages," said another Beijing-based U.S. agricultural official, who asked not to be named as he is not authorised to talk to the media.

"Farmers just buy the seeds that look like they might work and aren't too expensive. They have no real information."

http://www.reuters.com/article/2012/11/11/china-corn-idUSL3E8M221920121111

Source: SeedQuest.com

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1.09 **New sweet potato variety triples yield in Rwanda**

A new variety of sweet potato, dubbed as Orange-fleshed Sweet Potato, is reported to have increased farmers' yield from four tons to 12 tons per hectare in Rwanda's Gakenke District. The said variety was developed by the Sweet Potato Action for Security and Health in Africa (SASHA) and the Rwanda Agriculture Board (RAB), acknowledging the significance of the crop in the country. Responding to the increased output, farmers have appealed to the government to avail more land for them to maximize the crop's production. Rwanda is the third largest consumer of sweet potato in Africa. Authorities suggest that farmers should be encouraged to make the tuber a food crop as well as a cash crop.

For more information, visit http://allafrica.com/stories/201210150087.html

Source: Crop Biotech Update 17 October 2012

Contributed by Margaret Smith
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1.10 **New rice varieties to increase upland farmers' yield in the Philippines**

Thirteen new rice varieties which were developed through the effort of the Philippine Rice Research Institute (PhilRice) and the International Rice Research Institute (IRRI) are seen to give hope to the indigenous and other upland farmers in the Philippines. These rice varieties are believed to give yield far higher than their conventional counterparts. One of the varieties, known as NSIC Rc23 or Katihan 1, is reported to yield for up to 7.6 tons per hectare after 100 days compared to conventional rice's yield of less than 2 tons per hectares which is grown only once a year. The initiative is part of the Improving Livelihoods and Overcoming Poverty in the Drought-Prone Lowlands of South and Southeast Asia project funded by International Fund for Agricultural Development. See PhilRice's news release at

http://www.philrice.gov.ph/?page=resources&page2=news&id=191

From CIMMYT e-Newsletter

Source: Crop Biotech Update November 7, 2012

Contributed by Margaret Smith
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1.11 **Nutritionally-enhanced maize reaching Filipino farmers and families**

Agricultural extension agents are getting seed of quality protein maize to the mountainous areas in the Philippines and encouraging smallholder farmers in its use. Widespread use of this nutritionally-enhanced maize can potentially help reduce rice dependency, improve child nutrition, and supply grain for inner city school meal programs.

Read more
http://www.cimmyt.org/index.php?option=com_content&view=article&id=1397&Itemid=521)

From CIMMYT Informa 1813

Source: Crop Biotech Update November 7, 2012

Contributed by Margaret Smith
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1.12 **WEMA prepares for commercial release of new varieties**

Twenty-nine drought-tolerant, early maturing, disease-resistant hybrids developed by the Water Efficient Maize for Africa (WEMA) project are getting ready to be released, a huge success for WEMA and all its stakeholders. “The 29 hybrids advanced to national performance trials is a record release by an entity in Africa in all times. These high performing hybrids yield 20–35 % more grain under moderate drought compared to 2008 commercially available hybrids,” said Stephen Mugo, CIMMYT principal scientist and co-chair of the WEMA Product Development Team. “Let us seize the technological opportunities that are there to boost productivity and people’s welfare,” he added. The white hybrids resistant to stem borers, maize weevils, and large grain borer, and to diseases such as grey leaf spot, northern leaf blight, and maize streak virus will complement other drought tolerant hybrids developed and released by the Drought Tolerant Maize for Africa (DTMA) initiative. These first WEMA hybrids were developed from CIMMYT’s drought tolerant germplasm accelerated using the doubled haploid technology from the Monsanto platform.

Source: Crop Biotech Update November 7, 2012

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1.13 **Major international push to maximise bioscience research to help world's poorest farmers**

United Kingdom
November 20, 2012

- Sequencing historical DNA to tackle wheat's worst enemy
- Unlocking ancient rice secrets to overcome rainfall extremes
- Leaving a bad taste in aphids' mouths
- Reducing crop losses with cereals that respond to pest attack
- Exploiting wild wheat to produce better Indian varieties

Over 40 international research organisations are joining forces in a unique £16M initiative that will harness bioscience to improve food security in developing countries. Funding has been awarded to 11 new research projects, announced today, which will develop ways to improve the sustainability of vital food crops in sub-Saharan Africa and Asia. The projects aim to develop staple crops better able to resist pests or thrive in harsh environmental conditions.

Food security is a major issue with over one billion people across the world already undernourished and the global population forecast to reach nine billion by 2050. These new research projects are expected to increase sustainable crop yields for farmers and their local communities within the next 5 to 10 years and the knowledge and skills developed as part of these projects will be beneficial for crop production globally.

The grants have been awarded by the Biotechnology and Biological Sciences Research Council (BBSRC) under the Sustainable Crop Production Research for International Development (SCPRID) programme, a joint multi-national initiative of BBSRC and the UK Government's Department for International Development (DFID), together with (through a grant awarded to BBSRC) the Bill & Melinda Gates Foundation (BMGF), and the Department of Biotechnology (DBT) of India's Ministry of Science and Technology.

Deputy Prime Minister Nick Clegg said: "One billion people currently go to bed hungry every night. By 2050 there will be another two billion mouths to feed. And experts predict the world will need to be able to grow 70 per cent more food.

"The UK's world class bioscience sector is dedicating vital knowledge and expertise to tackling this global problem. This investment will bring together experts at 14 British Universities and Institutes who will work with famers in Africa and Asia to develop crops that are resistant to disease, pests and drought.

"Farmers need these innovations to protect their own livelihoods and the health of their communities."

Minister for Universities and Science, David Willetts, said: "This global collaboration will build on the UK's world leading position in bioscience and will benefit millions of people through improving food security in Sub-Saharan Africa and South

Asia. It will help us share knowledge and forge closer links with the international research community, whilst improving skills and creating jobs in the UK."

Lynne Featherstone, Parliamentary Under-Secretary of State for International Development, said: "Staple crops are essential to millions of farmers across Sub-Saharan Africa and South Asia, both for food and income. All too often, environmental conditions and pests cause serious crop failure, with devastating consequences for individual farmers, their families and their communities.

"Producing crops better able to grow in harsh conditions will not only tackle malnutrition, but also increase the chances for families to earn an income in order to afford education and health care, which is why DFID is providing funding to this potentially life-saving initiative."

Sam Dryden, Director of Agricultural Development at the Bill & Melinda Gates Foundation,commented: "Many small farmers in the developing world cannot grow enough food to eat, let alone sell. Innovation in agriculture is vital to resolve this and we hope these projects will sustainably improve agricultural productivity, build skills and resources in developing countries, and ultimately help farming families build better lives."

Professor Douglas Kell, BBSRC Chief Executive, said: "Providing safe, affordable and nutritious food for everyone is one of the greatest challenges we face. This ground-breaking international partnership, of funders and scientists, will ensure that cutting- edge, fundamental bioscience is combined with vital local knowledge to develop sustainable, affordable solutions to increase crop yields and improve global food security."

The new initiative is being coordinated by BBSRC. The £16M is made up of £3M from BBSRC, £5M from the Bill & Melinda Gates Foundation (through a grant to BBSRC) and £7M from DFID. A further £1M has been provided by the DBT of India's Ministry of Science and Technology for projects involving India.

Each project includes at least one partner from the UK and one from a developing nation. This approach, used by BBSRC and DFID in previous programmes, aims to build scientific capacity in developing countries, with the aim of developing research teams and projects that tackle other local scientific challenges.

Examples include:

Sequencing historical DNA to tackle wheat's worst enemy
Using new DNA sequencing technologies and a variety of strains of the wheat disease 'yellow rust' from Africa, India and the UK, an international team of researchers will sequence current and historical collections of the disease to understand how it has evolved and to look at wheat genes best able to resist the pathogen in the future.

Unlocking ancient rice secrets to overcome rainfall extremes
Researchers from the UK, USA and India will work together to access valuable genetic information about variation in ancestral wild species of rice to try and identify beneficial segments of the genome that help plants survive drought.

Leaving a bad taste in aphids' mouths

Aphid-transmitted viruses pose a serious risk to beans and other major crops, resulting in large losses. An international team will survey bean growing areas in three distinct ecological zones within Uganda to look at how virus infection shapes the distribution of aphids under natural conditions.

Reducing crop losses with cereals that respond to pest attack
Using state of the art semiochemical identification and genetic analysis technology the researchers will work with local farmers to look at different crop varieties and define genetic markers associated with the semiochemical trait to enable breeding programmes to move the trait into better crop varieties.

Exploiting wild wheat to produce better Indian varieties
Over the next five years, an international team of scientists will examine genetic variation in wild wheat species to identify traits which could be used in cultivated varieties, providing tolerance to abiotic stresses such as heat and drought tolerance as well as biotic stresses such as resistance to pests and diseases.

To download summaries of all projects being funded by the initiatives, see: www.bbsrc.ac.uk/web/files/publications/1210-scprid.pdf

UK Universities and Institutes partners are:

- Cranfield University
- Imperial College London
- John Innes Centre
- National Institute of Agricultural Botany
- Rothamsted Research
- The Sainsbury Laboratory
- University of Cambridge
- University of East Anglia
- The University of Edinburgh
- University of Exeter
- The University of Nottingham
- The University of Sheffield
- University of Southampton
- The University of York

About Bill & Melinda Gates Foundation Guided by the belief that every life has equal value, the Bill & Melinda Gates Foundation works to help all people lead healthy, productive lives. In developing countries, it focuses on improving people's health and giving them the chance to lift themselves out of hunger and extreme poverty. In the United States, it seeks to ensure that all people-especially those with the fewest resources-have access to the opportunities they need to succeed in school and life. Based in Seattle, Washington, the foundation is led by CEO Jeff Raikes and Co-chair William H. Gates Sr., under the direction of Bill and Melinda Gates and Warren Buffett.

About DFID
TheDepartment for International Development (DFID) is the government department responsible for promoting sustainable development and reducing poverty. The central focus of DFID is a commitment to the internationally agreed Millennium Development Goals to be achieved by 2015. For more information, visit our website at www.dfid.gov.uk.

http://www.seedquest.com/news.php?type=news&id_article=31573&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.14 **African farmers now select seeds for their needs**

By Roxana Earle

important aim of the African Centre for Crop Improvement (ACCI), a plant breeding initiative based at the University of Kwa Zulu Natal, UKZN in Pietermaritzburg spear-headed by Mark Laing, Professor of Plant Pathology.

“The idea is to ask the farmers what they want, in a scientifically structured survey process. After analysing the farmers’ responses, we can identify the key traits they want in their crops. We even take it further, and the Phd students may ask the farmers to help them choose the best plants, with the best taste, colour, shape etc.
These new crop varieties are readily adopted by the farmers. After all, they chose them”, said Laing.

This concept of seed development based on traditional plant breeding methods has come about since the inception of the ACCI in 2002.

“When we started out, we were told that the ACCI program would definitely fail, that such an ambitious project could never work. But with the right team of experienced plant breeders to teach and supervise the students, it has worked even better than we had hoped. 100% of the ACCI graduates have stayed in Africa, mostly to work on food crops in their home country, in their country’s National Agricultural Research Institute.

So successful has this program been that Professor Laing and the ACCI recently received an award of recognition from Mr Kofi Anan Chairperson of AGRA (A Green Revolution for Africa forum) at a prestigious conference held in Arusha , Tanzania. The stature of this conference is supported by heavy weights of the community development world, including Melinda Gates of the Bill and Melinda Gates Foundation, Dr Gary Toennissen, MD of the Rockefeller Foundation, President of Tanzania, Mr MJM Kikwete and Dr I.A. Mayake, CEO of NEPAD

Forty two students from fourteen countries have graduated with doctorates; a sister organization in West Africa, WACCI is training another 58 plant breeders in a parallel program.

Currently 38 more students students are working with seventeen plants including millet, sorghum, African rice, cassava, sweet potatoes and teff, each staples in their respective countries.

A stroke of genius by Dr de Vries of AGRA, was to continue funding the students after graduation. This has allowed them to continue their PhD breeding programs to the point of releasing many new crop varieties, lines and hybrids.

“Our students do not lose momentum in the breeding of their crop, they just blossom after they graduate!” said Professor Laing.

Please request any images you may require in high resolution.
Captions:

9647: L-R Prof Mark Laing Director of the ACCI, UKZN is congratulated by Mr Kofi Anan, Chairperson of the AGRA Forum.

3000
L-RDr JaneIninda Program Officer, Crop Improvement and Farmer Variety Adoption, PASS; AGRA Dr Rufaro Madakadze Program Officer, Education and Training, AGRA; Dr Julia Sibiya, ACCI Maize breeder and Lecturer In front of maize varieties bred by Dr Sibiya.

3340
Dr Paul Shanahan, ACCI and UKZN Senior Lecturer in Plant Breeding
Dr Martin Chiona, Cassava and Sweet Potato Breeder, Manza Station, Zambia
Prof. Rob Melis, ACCI, Plant Breeder.in a field of cassava varieties bred by Dr Chiona for yield, earliness, virus resistance and good cooking qualities.

5388
L-R Dr Richard Edema (Makerere University, Uganda), a fellow AGRA awardee for training MSc students; Dr Joe de Vries, Director of AGRA’s program for Africa’s Seed Systems (PASS), which funds the capacity building programs at Makerere University and UKZN; and Prof. Mark Laing, Director of the ACCI, UKZN.

9860
L-R - Prof. Hussein Shimelis, ACCI, Plant Breeder
Dr Fentahun Mengistu, Director, Amhara Regional Agricultural Research Institute (ARARI) Bahir Dar, Ethiopia; Professor Mark Laing, Director of the ACCI.
Ends

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1.15 **Funding opens up NIAB wheat transformation resource to plant research community**

NIAB has been awarded £620,000 to provide a community resource for wheat transformation.

November 16, 2012

The five-year project is funded by the BBSRC's Biological and Bioinformatic Resources fund (BBR) and will give UK plant scientists free access to the most efficient public wheat transformation system currently available anywhere in the world.

Project leader Dr Emma Wallington says: "At NIAB we can add a new gene into a wheat cell, which already contains an estimated 150,000 genes, and regenerate a new 'fine-tuned' wheat plant. This is an important tool which helps us understand what effect the gene has on the plant and is much more precise than traditional breeding techniques. It allows a functional analysis of genes for research and, importantly, a viable route to breeding new traits for commercial exploitation through traditional breeding techniques."

Starting with 100 immature spring wheat seeds, the NIAB Crop Transformation Team can regenerate transformed wheat plants from 30-50% of the original seed, well above current industry standards. As only one plant is regenerated per seed the researchers can be sure that all of the regenerated plants are individual. NIAB can produce more than 3,000 independent transformed wheat plants per year.

"The high efficiency transformation method we use was developed using an American wheat variety. BBSRC funding will allow us to evaluate 50 UK and European wheat varieties with this method to identify those closer to home that work well, extending the practical value of this technology to UK-grown wheat," explains Dr Wallington. To promote its use by plant scientists BBSRC will also fund the transformation of 50 novel genes, producing around 30 unique transgenic wheat plants for each gene. This will be one of the largest experiments undertaken in wheat transformation and will test genes from a wide range of plant species. "Everyone involved in this study is excited by its potential to discover new genes that may make future improvements to a crop that's so important to UK agriculture," says Dr Wallington.

NIAB has licenses to provide wheat transformation services for both academic and commercial groups which permit future development of commercial products in wheat in Europe. This gives academic researchers an advantage that potentially enables them to translate their research without the need for further licensing or royalty payments.

GM crops have to date been largely confined to traits giving resistance to herbicides or insects, but a new generation of traits which confer drought tolerance, disease resistance, yield improvements or health benefits are now being examined. These could have an important role to play in achieving food security and future increases in production. Some of these genes come from other crop species and would be impossible to study in wheat without GM.

Professor Andy Greenland, NIAB's Director of Genetics and Breeding says: "Wheat is the most important crop in the UK with good growers achieving more than 10t/ha. But if the UK is to double wheat production over the next 40 years to meet consumer demand, the current annual increases made by plant breeders of around 75 kg/ha must improve three-fold. Meanwhile our climate is changing and we need wheat

varieties that are better adapted to drought and reduced fertiliser inputs to maintain a sustainable supply of affordable, nutritious and safe food.

“Many technologies will contribute to tackling the challenge of increasing crop production and it is inevitable that genetic modification (GM) will make a contribution. This will either be directly, with the development and introduction of GM wheat varieties with new traits, or indirectly, as a research tool to better understand how genes for particular traits function. Open access to these transformation resources could have a significant impact on the future success of UK wheat production,” says Professor Greenland.

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1.16 **Syngenta Breeding Academy helps bring integrated crop solutions to market more quickly**

Minnetonka, Minnesota, USA
November 19, 2012

- Academy broadens understanding of opportunities and enablers of crop productivity improvement through plant breeding
- Global initiative enables ongoing professional development on science and competencies tied to plant breeding and related disciplines
- Goal is to provide better seed products and integrated crop solutions to growers

A first-of-its kind global learning initiative is providing Syngenta employees working in plant breeding and related disciplines with ongoing access to knowledge and programs to enhance their life-long professional development. The Syngenta Breeding Academy is also helping deliver breeding innovation and integrated crop solutions to market more quickly.

According to Heather Merk, Breeding Academy program lead at Syngenta, this learning initiative is a key element of the Syngenta research and development (R&D) strategy. “The Syngenta Breeding Academy is a world class professional development program for our employees in plant breeding and related disciplines,” Merk said. “The program is designed to develop and enhance technical and collaborative skills. It helps us to think like a grower and deliver integrated solutions around the world, beginning with the seed. Breeding Academy topics include: foundations of breeding knowledge; updating role-specific skills; best practices and approaches for integrated breeding; and breakthrough programs to advance R&D beyond current realities.”

The Syngenta Breeding Academy seeks to help plant breeding professionals, and those who work with them, better understand R&D’s role in meeting customer needs to feed a growing global population. Ray Riley, head of germplasm technology at Syngenta, says it begins with asking the right questions.

“Reframing the discussion around the user experience helps us to anticipate customer needs and sustainably improve agricultural productivity,” Riley said. “Our people are the source of our plant breeding innovation, and harnessing their collective skill is key to bringing that innovation to market. It’s no longer enough to possess skills or knowledge in plant breeding. Today, it’s critical to understand how to engage others who have skills and knowledge that complement our own.”

Through its Breeding Academy, Syngenta is also working collaboratively with leading universities around the world to support them as they prepare students for careers in plant breeding and related disciplines.

“In addition to providing an environment for life-long learning at Syngenta, we are committed to helping develop the skills of those who will work in plant breeding tomorrow,” Riley added. “We want to help them better understand how to bring their skills to a project team, and how to leverage the interface between R&D and other disciplines. The rate of change in genetic information and new technology is dramatic. We want to help plant breeders, and those who work with them, lead that change.”

http://www.seedquest.com/news.php?type=news&id_article=31534&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.17 **Rwanda: New Seed Varieties to Boost Bean Production**

October 21, 2012

By Stephen Rwembeho

In a bid to improve food production, HarvestPlus, a Global Challenge Program of the Consultative Group on International Agricultural Research (CGIAR), has come up with new varieties of beans that are set to increase yields.

The new iron-rich bean varieties were bred by the Rwanda Agricultural Board (RAB) and the International Centre for Tropical Agriculture (CIAT).

According to Lister Katsvairo, HarvestPlus Country Manager, the new variety has the ability to do well in drought prone areas and mature within less than three months. He noted that HarvestPlus seeks to develop and disseminate staple food crops, which are relatively high in bioavailable micronutrients as a promising means to reduce micronutrient malnutrition in developing countries.

"The initial target micronutrients are iron, zinc, and vitamin A. We shall support farmers, both big and small. Our aim is to allow every household to produce and eat iron-rich beans".

Katsvairo, noted that in Rwanda, anemia, which is used as an indicator of iron deficiency, afflicts almost one out of five non-pregnant women and 40 percent of children underâ€• five years.

"Children and women will be the main beneficiaries of these new bean varieties, which could provide up to 30 percent of their daily iron needs. Anemia in pregnant mothers and adolescents is common in Rwanda, the beans thus offer a solution," he said.
He added that HarvestPlus operates all over Africa, but Rwanda's culture makes it a potential beans hub for the continent.

Katsvairo said the project that started 5 years ago, was expected to continue until 2018.
"We spend not less than $1 million a year in Rwanda. This is quite a lot but worth the investment. Farmers are offered all sorts of support; including exposure. We thus expect a big boost in health and the economy".

HarvestPlus impact
Farmers have conceptualized the idea of growing new bean seed varieties. A local Seed Company known as Rwanda Improved Seed Company (RISC) was recently born in Matimba Sector of Nyagatare District.

http://allafrica.com/stories/201210210257.html

Source: SeedQuest.com

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1.18 **'Mendel's Tomato Plants' teaching package a great success**

Wageningen, The Netherlands
October 11, 2012

Wageningen UR and plant breeding company Nunhems provide secondary schools with seeds and teaching package

Since 'Mendel's Tomato Plants' was introduced on 20 June 2012, some 100 Dutch and Belgian secondary schools have ordered seeds for (practical) classes about genetics and plant breeding via www.tomaatindeklas.nl. At an average of four classes per school, this means that the seeds will be sown by over 400 classes, and a grand total of around 12,000 students will be working with the accompanying 'Mendel's Tomato Plants' teaching package.

Genetic characteristics
Mendel's Tomato Plants' teaches Dutch reading students the concept of genetics by having them study the seedlings of tomato plants. In doing so, students are able to see with their own eyes how genetic characteristics are passed on. In practical lessons, for example, students can count how many plants have light-coloured seed leaves, and how many dark-coloured. A second experiment looks at the colour of the seed leaves and the variation in the colour of the stems; purple-green or green. In this way students can evaluate Mendel's laws and learn the basic principles used by plant breeders, for instance, to develop better and healthier food.

The ‘Mendel’s Tomato Plants’ teaching package is a joint initiative between vegetable seed company Nunhems (part of Bayer CropScience) and the Plant Sciences department of Wageningen UR (University & Research Centre). It originated from a European research network of universities and companies focused on the tomato (EU SOL). The teaching package was developed by De Praktijk, a project bureau for (natural) science education and communication. The education package, of “Mendels’s Tomato Plants”, is only available in Dutch.

The vegetable seed company of Bayer CropScience, which operates under the name Nunhems, is a global specialist in seeds and concepts. Internationally integrated teams develop unique relations with clients, while sharing products, services and knowledge with professional horticulture and vegetable chains. The company’s product range consists of 28 vegetable crops and 2,500 varieties, including leading varieties of carrot, cucumber, leeks, lettuce, melon, onion, capsicum, tomato and watermelon. With over 1,700 employees Nunhems is present in all major product fields worldwide.

http://www.seedquest.com/news.php?type=news&id_article=30840&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.19 **Applications for intellectual property protection on new plant varieties reach 10,000 in China**

Beijing, China
November 21, 2012

Applications for New Plant Varieties hit 10,000 in China as of Nov.2nd, 2012. It means the goal set in the Outline of the National Intellectual Property Strategy in Agriculture is fulfilled three years ahead of the schedule. China ranks the second among the UPOV member states in terms of annual filings.

Counsel Shi Yanquan from MOA Department of Science, Technology & Education attended the celebration event marking the 10,000 applications for New Plant Varieties on Nov. 15th, 2012. In his speech, Shi stressed that the rapid growth in application number had benefited from the greater importance attached by the MOA leaders to agricultural intellectual property rights and continued support in breeding innovation. It also owe to the unremitting efforts of owners and breeders, as well as the implementation of the national outline of intellectual property strategy and the outline in agriculture.

Deputy Director-General Ma Shuping from MOA Bureau of Seed Management pointed out that China has made remarkable achievements in new variety protection since the promulgation of the Regulations of the People's Republic of China on the Protection of New Varieties of Plantsin 1999 and China's accession into UPOV. Over the past five years, applications for New Plant Varieties amounted to 5610, taking 56% of the total applications over years. 2477 were approved, representing 64% of the total 3880 applications.

The approved applications include a group of quality new varieties, inter alia Zhongdan 909, Jingke 968, and Nonghua 101 for corn, Y Liangyou No.1 and Xin Liangyou 6 for rice, Shimai 15 for wheat. These varieties will be a driving force for stable growth in grain production and farmer's income.

But Ma also noted the other side of the coin in new variety application, such as great similarity among existing varieties and applied varieties, weak competitiveness in international market, few applications for high valued cash crops, conflict between review capacity and increasing number of applications, and lack of international perspective. Therefore it is urgent to take further measures and strengthen management.

Ma implied that following the principle of "adhering to science-based review, guaranteeing rights and interests, encouraging innovation and promoting the industry", China will act in the following aspects:

1. To improve regulations, encourage innovation in breeding and intensify cracking-down on violations in line with the changing situations.
2. To enhance research and services, expand the coverage for the protection of new varieties of plants, establish and perfect database for existing varieties,standard varieties and similar varieties so as to offer strong technical support for guaranteeing breeder's rights and interests.
3. To strengthen administrative law-enforcement,get tough on infringing acts and counterfeiting, improve the level of executing law and its efficiency, thus to enable fair and orderly competition.
4. To enhance advocacy and training, and increase awareness-raising involving all links of seed industryso as to make the plant variety right protection system the propeller for introducing quality varieties from abroad.

http://www.seedquest.com/news.php?type=news&id_article=31588&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.20 **AC21 Wants USDA to investigate crop insurance for genetic harm to organic crops**

November 21, 2012
By Dan Flynn |

It held five meetings, waited until after the election, gained consensus among all but one of its members, sent off a 61-page report to the Secretary of Agriculture and now is waiting for the reviews, which are starting to come in.

Its consensus report envisions crop coexistence in a nation with a diverse agricultural base built on organic, conventional and genetically engineered (GE) crops with farmers free to make their own choices about what to do with their land.

The U.S. Department of Agriculture's Advisory Committee on Biotechnology and 21st Century Agriculture (AC21) came up with five recommendations aimed at a compromise that will help everyone get along, the most controversial of which is an insurance-based "compensation mechanism" that would come into play if economic losses were suffered by an organic crop from a GM or even conventional crop. Reaction to the AC21 report split along predictable lines.

In a statement, the American Farm Bureau Federation said it was pleased with AC21's report to Agriculture Secretary Tom Vilsack "to be used as guidance to enhance working relationships among farmers growing different types of crops, specifically biotech and non-biotech crops."

Farm Bureau's Vice President Barry Bushue, who was a member of AC21, said the report's recommendations "could benefit all of agriculture."

The environmental group Food & Water Watch does not like the insurance-based compensation mechanism. The AC21 recommendations "completely miss the mark by putting forth an insurance compensation mechanism that would be the financial burden of contamination on organic and non-GE farmers, while letting the patent holding biotechnology companies that created this technology avoid their responsibility," said Wenonah Hauter, F&WW executive director.

AC21's recommendation calls for work on loss data and creation of one or more pilot programs to develop the compensation program. Options might exist for purchasing insurance to entering into joint coexistence agreements with neighbors.

According to USDA, other AC21 recommendations include:

- Spearheading and funding a broad-based, comprehensive education and outreach initiative on coexistence.
- Working with all stakeholders to foster good crop stewardship and mitigate potential economic risks from unintended gene flow between crop varieties.
- Funding research relevant to coexistence in American agriculture.
- Working with seed suppliers to ensure a diverse and high quality commercial seed supply.

The only AC21 committee member who would not sign off on the consensus report was Isaura Andaluz, executive director of Albuquerque-based Cuatro Puertas (Four Doors). Andaluz objected to the onus being put on "non-GE farmers."

About half the report includes additional comments of AC21 members who signed on to the report, but many still expressed reservations.

Laura L. Batcha, the Organic Trade Association's policy chief, is disappointed there are no incentives for containment of GM crops recommended in the report.

Another AC21 member, Charles M. Benbrook, chief scientist at The Organic Center in Enterprise, OR, said early on it was clear the only compensation method that would clear the committee was one based on the crop insurance model.

Illinois farmer Leon Corzine said the AC21 "refutes the theory that there is a war in the countryside." "Any 'war' is created by organizations with headline grabbing sound bites," he said. "I have two organic neighbors and, as a lifelong farmer, I see no such war."

Josephine Lewis, director of agricultural development for Davis, CA-based Arcadia Biosciences, and also said data reviewed by AC21 shows that "lack of co-existence is not a widespread problem and there are a growing number of tools to facilitate co-existence management."

Angela M. Olsen, senior advisor and associated general counsel for DuPont and Company and its Pioneer Hi-Bred, endorsed the AC21 report, but not the recommendation calling for collecting data from seed companies.

"It remains unclear to me how this data would be collected, who would collect it, how it would be used, and what questions it would seek to answer," Olsen wrote. "Nor have any facts come to light in our deliberations that would justify such an unprecedented national program."

Editor's Note: Parts of a statement issued by USDA after this Food Safety News story was published is provided below:

The AC21 report was developed in response to the Secretary's request that this diverse committee examine what types of compensation mechanisms, if any, would be appropriate to address economic losses to farmers caused by unintended presence of genetically engineered materials, as well as how such mechanisms might work. The report also examines what steps should be taken by USDA to strengthen coexistence among different types of agricultural production systems.

"I am very pleased to have received this report from the AC21, because the report is the culmination of a great deal of hard work and complex discussion and review," said Vilsack. "I understand that required compromises to find common ground. We will carefully review the report and consider how best to move forward. USDA is proud to support all segments of agriculture and will continue to work to strengthen America's rural communities."

The AC21 is a broad-based committee composed of 23 members from 16 States and the District of Columbia. The members represent the biotechnology industry, the organic food industry, farming communities, the seed industry, food manufacturers, State government, consumer and community development groups, the medical profession, and academic researchers. The committee met five times since mid-2011 to address the Secretary's charge. The report was endorsed by 22 out of 23 AC21 members.

Secretary Vilsack designated his Senior Advisor, Brandon Willis, to lead a USDA team to receive and plan implementation of the report.

http://www.foodsafetynews.com/2012/11/ac21-wants-usda-to-investigate-crop-insurance-for-genetic-harm-to-organic-crops/

Source: SeedQuest.com

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1.21 **Horticultural breeders call for stronger protection of innovations**

Geneva, Switzerland
October 23, 2012

By Catherine Saez

The protection of intellectual property for plant innovation was at the heart of a recent conference on patents and modern plant breeders rights in horticultural breeding. The International Community of Breeders of Asexually Reproduced Ornamental and Fruit Varieties (CIOPORA) organised a conference on 20 September in Venlo, the Netherlands.

According to a release [pdf] by CIOPORA, "too close minimal distance set by UPOV [the International Union for the Protection of New Varieties of Plants] as a precondition of the new variety registration motivate the expansion of the grey zone of innovation where the results of breeding with only minor deviations from the existing ones can be registered as varieties."

At stake, according to CIOPORA, is the number of similar varieties of plants on the market and the status of breeders' intellectual property rights, which have an effect on the market price and might hinder horticultural innovations.

The horticultural sector, said CIOPORA, could benefit from a "well-balanced patent system comparable to the one in the USA." The asexually reproduced plants represent most fruits and a large number of ornamental species, such as roses or geraniums. Edgar Krieger, secretary general of CIOPORA, said in an earlier interview with Intellectual Property Watch that asexually reproduced varieties are easily reproduced by using a plant or part of a plant to multiply and duplicate the exact same plant variety with no technical means to restrict duplication.

According to the release, during the conference, Josef Straus, director emeritus of the Max Planck Institute for IP, Competition and Tax Law, said there were no economic or legal grounds for a differentiation between innovation in horticulture and other plant breeding industries, and the IP protection system should be similar for both, "with minor horticulture-specific deviations."

http://www.seedquest.com/news.php?type=news&id_article=30772&id_region=&id_category=&id_crop=

Source: *Source: Intellectual Property Watch*

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1.22 **UPOV hails benefits of plant variety protection; civil society frustrated**

Geneva, Switzerland
November 5, 2012

By Catherine Saez

The International Union for the Protection of New Varieties of Plants (UPOV) held a symposium last week on the benefits of plant variety protection as a way to help mitigate agricultural challenges and improve the livelihood of farmers. Also last week, during the UPOV Council, civil society denounced a push for a more stringent version of the UPOV Convention, and said new rules for observers were disappointing. A new president and a new vice-president were elected by the Council on 1 November. The new president is Kitisri Sukhapinda, attorney advisor in the Office of Policy and External Affairs at the United States Patent and Trademark Office (USPTO) and previous vice-president. Luis Salaices, head of the Variety Register Unit, Spanish Ministry of Agriculture, Food and Environment, is the new UPOV vice-president.

The UPOV press release on the outcome of the Council is here [pdf].
On 2 November, UPOV held a symposium on the benefits of plant variety protection for farmers and growers, which gathered a number of stakeholders. The symposium looked at the role of plant variety protection (PVP) in improving income for farmers and growers, and during a second session, the role of PVP in enabling farmers and growers to become breeders.

This symposium follows two previous events of the same nature. The first symposium was held from 11-12 April 2011 and focused on PVP and technology transfer, and the benefits of public-private partnerships.

The second symposium was held on 21 October 2011 considered plant breeding for the future.

Francis Gurry, director general of the World Intellectual Property Organization and secretary general of UPOV, opened the symposium, saying that “plant breeding and plant protection is as important and maybe more important today at it was 50 years ago when the UPOV system was first established.”

Better plant varieties were presented by most speakers as being able to address issues such as risks linked to climate change, to increase production to meet the rising global population with shrinking arable land, to answer the demand for higher standards, and to raise income for farmers. Thor Gunnar Kofoed of the General Committee for Agricultural Cooperation in the European Union said in Europe cereal production is stalling and farmers need to learn how to treat crops, use new varieties, and produce more.

The experiences of small-holder flower growers in Kenya and fruit growers in France were presented, highlighting the importance of PVP in increasing income. The speakers stressed the importance of uniformity and quality of the products, and high productivity to gain competitiveness.

Intellectual property rights are an important tool for producers in developing countries for food security and market access but there is a need for a mechanism for fair play between farmers and breeders as sometimes seed prices are prohibitive for small farmers, said Simon Maina, senior inspector for the Kenya Plant Health Inspectorate Service, called at the last minute to replace the original speaker.

Stephen Smith, germplasm security coordinator for Pioneer Hi-Bred International, said in the context of the challenges facing agriculture in the next 50 years, the genetic contribution from plant breeding was critical and intellectual property protection vitally important. Dupont-Pioneer is focused on understanding farmers’ needs to be able to

provide them with the seeds that meet those needs, he said, adding, “Local issues drive local product development.”

Farmers’ seeds and UPOV varieties follow different rules

Guy Kastler, speaking on behalf of the farmers’ group Via Campesina, said today 70 percent of global food production comes from subsistence farming, and less than 2 percent of all farmers use mechanised equipment. Subsistence farming has a very different seed system than the one used by commercial farming, he said. “We produce our seeds in the same field as the one we produce food,” he said. They do not have a special plot of land devoted for breeding.

Part of the harvest is used to re-sow which allows farmers to adapt their seeds to evolving local conditions, he said. In order to conserve biodiversity small quantities of seeds are exchanged between farmers, which might be in contradictions with some national interpretations of the breeders’ rights, he said.

The UPOV system has brought a number of improvements but also new varieties which are adapted to pesticides, fertilizers, mechanised agriculture, and irrigation, and meant for large-scale farming. The informal farmer seeds system is much more effective when it comes to adapt to local conditions each year, he said.

Although this is not due to the 1991 UPOV convention, he added, a large number of UPOV member countries use the same criteria of uniformity and stability used by UPOV for their certification and national registration, which are conditions for access to market.

Another problem with the 1991 Convention, according to Kastler, is that the protection has been extended to essentially derived varieties. This leads to a situation where some varieties which are protected by PVP are coming from plants already protected by a patent on processes or genes. When a farmer buys a bag of seeds, he does not know if there is a patented gene inside, he only becomes aware of the fact when it is time to commercialise his products and is asked to pay royalties, he said.

In countries which have this double layer of protection, small breeders are disappearing, he said, bought by large breeders which own the largest patent portfolios. That is dangerous for biodiversity and threatens the food sovereignty of countries, he said.

UPOV is at a crossroads between whether it will support farmers against the patent system while respecting the farmers’ right to re-sow their own harvest, or whether PVP will become a patent, he concluded.

Gurry’s UPOV 91 push; rules for Africa, regions; bristling civil society

At the close of the UPOV Council on 1 November, the Association for Plant Breeding for the Benefit of Society (APBREBES) issued a press release voicing their disappointment over the new rules for granting observer status. Despite inputs provided by APBREBES, they said “these rules make UPOV less inclusive.” Of particular concern is a rule concerning international nongovernmental organisations with different coordination entities. The observer status will only be granted to one coordinating group per organisation.

This rule, according to APBREBES, “is clearly aimed at targeting farmer groups such as la Via Campesina, the largest famers’ organisation worldwide, which has ‘regional

coordination entities' as part of its structure." The European Coordination of la Via Campesina currently has observer status at UPOV but the new rule will prevent participation of other coordination entities such as Latin American Coordination of Countryside Organizations, they said.

The new rule will "further exacerbate the current imbalance in the representation of stakeholder groups" in UPOV, they said, claiming that the seed industry benefits from a large representation at UPOV. Syngenta, they said, is represented in UPOV by "CropLife, the International Seed Federation, the European Seed Association, CIAPORA, the African Seed and Trade Association and the Asian and Pacific Seed Association."

APBREBES also reported that at the UPOV Council, Gurry "called on all member states to ratify the UPOV Act of 1991 in order to ensure a 'constitutional clean-up'". UPOV 91 has been described by civil society as giving more rights to the breeder to the expense of farmers.

Concerns on African regional framework

The African Regional Intellectual Property Organization (ARIPO) has been working on a regional draft legal framework for the protection of new varieties of plants. During the UPOV Council, the representative of ARIPO made a statement in which he mentioned the advancement of the legal framework, according to sources.

In the statement, ARIPO thanked a number of organisations for financial assistance, technical support and technical inputs. The statement mentioned the USPTO for financial assistance, UPOV and the European Union Community Plant Variety Office for technical support, the International Community of Breeders of Asexually Reproduced Ornamental and Fruit Plants, and the African Seed Trade Association for technical inputs. The statement also mentions general support from the French Groupement National Interprofessionel des Semences (interprofessional seed association).

Those elements are characterised by APBREBES as an unbalanced process to "develop new laws on plant variety protection for the 18 Member States of the ARIPO region."

The views or interests of small-scale farmers "which dominate more than 80% of the agricultural systems of ARIPO member states," have not been taken into consideration, they said, in disregard of Article 9(2)(c) of the International Treaty on Plant Genetic Resources for Food and Agriculture on farmers' and indigenous communities participation in decision-making.

http://www.seedquest.com/news.php?type=news&id_article=31079&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.23 **Unlocking ancient rice secrets to overcome rainfall extremes**

York, United Kingdom
November 2, 2012

Researchers from the UK, USA and India, led by scientists at the University of York, are embarking on a major four-year project which aims to develop new strains of rice to help to feed millions of people.

The aim of the project is to develop varieties of rice that will be more resistant to extremes of climate to provide subsistence communities in India and elsewhere with more stable grain yields.

Rice is the staple food for more than two billion people, but a quarter of global rice production – and 45 per cent in India – is in rain-fed environments. With climate change predicted to cause more droughts and flooding in the future, the challenge is to develop rice strains that are both drought and submersion tolerant.

A team involving scientists in the Centre for Novel Agricultural Products (CNAP) and the York Environmental Sustainability Institute (YESI) will work with scientists at Cornell University in the USA and the Central Rice Research Institute in India.

The researchers aim to gather valuable genetic information about variations in ancestral wild species of rice to identify beneficial segments of the genome that help plants survive drought and flood. These segments from ancestral rice genomes will then be bred into commercial rice varieties.

In parallel, researchers in India will conduct field trials using hundreds of lines of a commercial elite variety of rice carrying different segments of chromosome DNA from wild ancestors to gauge how these different lines grow under challenging conditions in the field. Using this field information, scientists in York and at Cornell will build up a detailed genetic picture of what causes increased resistance to drought in specific lines of rice.

The York team will help to establish the genetic and molecular basis of the drought tolerance in rice and then use that information to breed into local varieties more rapidly. The work at York also involves socio-economic studies to identify and address the socio-economic barriers to adoption of new drought resistant varieties as well as modelling the impact of new varieties on production of rice in the context of climate change.

The Director of CNAP, Professor Ian Graham, said: “This project builds on a discovery by Professor Susan McCouch at Cornell University that some wild ancestral species carry very beneficial genes even though they aren’t very good at producing grain. She has developed populations that have got segments of the wild ancestral species genome introduced into commercial varieties and these can now be used to discover drought tolerant lines.

“The aim of this project is not so much to increase yields overall but to stabilise them under environmentally challenging conditions such as drought or floods. It’s using modern molecular methods to produce more robust crops that are not going to fail one year and perform well the next but perform more predictably under those environmentally challenging conditions.

“It’s important for us to get those varieties out to poorer subsistence farmers. My vision is that we are not just doing work that will feed people but work that will also make them better off and lift them out of poverty.”

Professor Sue Hartley, the Director of YESI, added: “This project is particularly exciting because it combines the use of the latest molecular techniques for plant breeding with large-scale modelling of crop performance under different climatic conditions and a socio-economic assessment of the uptake of new crop varieties and their impact on farmer livelihoods. This sort of collaborative inter-disciplinary approach is what we need to address key challenges such as improving global food security.

"By bringing together such diverse expertise we will ensure that the research project makes a significant contribution to improving the sustainability of food production for farmers in India and that the benefits of the research reach those who need them. Our long-term partnership with colleagues at the Central Rice Research Institute in India will further aid this process and means that our project will have lasting impact.”

At the end of the four-year project, the international team hope to produce improved drought tolerant rice varieties that are accepted and adopted by local communities in rain-fed areas of India, as well as new breeding tools to enable rapid further development of new rice varieties.

The grants have been awarded by the Biotechnology and Biological Sciences Research Council (BBSRC) under the Sustainable Crop Production Research for International Development (SCPRID) programme, a joint multi-national initiative of BBSRC and the UK Government’s Department for International Development (DFID), together with (through a grant awarded to BBSRC) the Bill & Melinda Gates Foundation (BMGF), and the Department of Biotechnology (DBT) of India’s Ministry of Science and Technology.

Professor Ian Graham talks about the research

http://www.seedquest.com/news.php?type=news&id_article=31607&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.24 **Centers of origin for corn published in Mexico's Diario Oficial (Federal Register)**

Mexico City, Mexico
November 12, 2012

USDA/FAS GAIN report MX 2082

Report highlights
On November 2, 2012, the Mexican Secretariat of Agriculture and Secretariat of Environment published an Agreement on the areas delineating the centers of origin and centers of corn genetic diversity in Mexico’s Federal Register (Diario Oficial). As

informed previously, this map corresponds only to the northern Mexican states and contains areas which were previously approved for experimental and pilot phases such as in the states of Chihuahua and Sinaloa.

General Information
Disclaimer: This summary is based on a cursory review of the subject announcement and therefore should not, under any circumstances, be viewed as a definitive reading of the resolution in question, or of its implications for U.S. agricultural export trade interests. In the event of a discrepancy or discrepancies between this summary and the complete resolution or announcement as published in Spanish, the latter shall prevail.

Title of Notice: Agreement to Determine the Centers of Origin and Centers of Genetic Diversity of Corn in Mexico has been published in Mexico's Federal Register.

Type of Resolution: Final Assessment.

Publication Date: November 2, 2012

Products Affected
Corn Grain and Seeds. Agency in Charge: Secretariat of Agriculture, Livestock, Rural Development, Fishery and Food (SAGARPA) and Secretariat of Environment and natural Resources (SEMARNAT).

Background
On November 2, 2012, the Secretariat of Agriculture (SAGARPA) and the Secretariat of Environment (SEMARNAT) published in Mexico's Federal Register an Agreement to Determine the Centers of Origin and Centers of Genetic Diversity of Corn in Mexico.

As mention in the recent GAIN report MX2072 (Biotech Corn and Centers of Origin in Mexico), this agreement is part of the legal process required by Mexico's Biosafety Law and includes a map delineating the areas in seven northern states of Mexico where the use of GM corn seeds will be forbidden. In addition, the law requires very strict requirements with storage and movement of GM corn grains through the areas delineated as centers of origin. According to Provision 86 of the Biosafety Law, the centers of origin and genetic diversity of corn in Mexico as well as the geographic areas in which the related species in question are found shall be determined jointly by a resolution issued by SEMARNAT and the SAGARPA. Both Secretariats have established their resolutions issuing the measures required for the protection of such species and geographic areas only for seven States for now.

Official Map
The shaded areas with have been determined to be either centers of origin for corn (and related species) and centers of genetic diversity covers a significant potion of total landspace (GAIN MX2072). This shaded area includes land that previously received permits for experimental and pilot release of GM corn varieties.

The Agreement allows for 2.1 million hectares of land to be eligible for potential GM corn planting in seven northern Mexican states. However, total area suitable for corn production in this area is only 562,133 hectares. The rest is desert or land not suitable for corn production. In addition, the Agreement calls for a zero tolerance level for GM corn seed in all areas determined as centers of origin for corn. Many opponents to the

Agreement claim that the methodology used to develop the map was not scientifically based and used out-dated information.

Comment
It is important to note that the Agreement can be modified after a year if/when new scientific data is brought to the Mexican government's attention which clearly show that areas now considered centers of origin and centers of corn genetic diversity are incorrect. While many supporters of biotechnology are disappointed with the Agreement and map highlighting the centers of origin for corn and centers of corn genetic diversity, others are taking an optimistic view as at least there will now be certainty as to where progress can be made in the future. Prior to this, uncertainty was always lingering causing major problems to the biotechnology companies striving to improve yields and profits for Mexican corn farmers. END COMMENT.

http://www.seedquest.com/news.php?type=news&id_article=31338&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.25 **Scientists develop dual disease resistant cassava**

Scientists from the Swiss Federal Institute of Technology (ETH) in Zurich have developed new transgenic cassava variety that is resistant to a pair of viral diseases--these include the notorious brown streak virus which originated in East Africa and is threatening to spread to Central and West Africa.

In order to make cassava resistant to the brown streak virus, the researchers modified the genetic make-up of one variety of cassava to produce small interfering RNA molecules (siRNA). The plant produces the siRNA naturally after virus infection, but the researchers have now tricked cassava to produce the siRNA in all of its parts before the virus can infect it. This prevents the virus from multiplying and spreading throughout the plant.

To make the variety resistant to another disease, scientists used the Nigerian TME 7 cassava variety, also known as "Oko-iyawo". This variety is naturally resistant to cassava mosaic disease, which is caused by another virus that is severely impacting cassava production throughout Africa. A researcher involved in the project said that this resistance is not changed by the new resistance to the brown streak virus.

View ETH's news release at http://www.ethz.ch/media/detail_EN?pr_id=1119

Source: Crop Biotech Update 17 October 2012

Contributed by Margaret Smith
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1.26 **Researchers develop drought resistant tea**

Researchers from the Tea Research Foundation of Central Africa have developed tea clones that can cope with the worst droughts in Malawi in recent years. Scientists used genetic biomarkers to develop the drought-resistant tea cultivars. Natural products such as tea are important cash crops in many African countries. According to the Malawi Confederation of Chambers of Commerce and Industry, the tea sector accounted for 7.9 per cent of the country's foreign exchange earnings in 2007, and employs about 40,000 people.

See the original article at http://allafrica.com/stories/201209140027.html.

Source: Crop Biotech Update 10 October 2012

Contributed by Margaret Smith
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1.27 **Zimbabwe to start growing drought tolerant maize soon**

Farmers in Zimbabwe will soon be able to plant drought-tolerant maize variety - SIRDAMAIZE 113. The new maize variety has fulfilled all the Zimbabwe Seed Services requirements and the seeds for planting are expected soon after a launch by Zimbabwe's Vice President, Joice Mujuru earlier in August 2012. SIRDAMAIZE 113 has been under development since 1997.

The new maize variety has been lauded as suitable for marginal rainfall areas of Zimbabwe often referred to as semi-arid zones. Under drought conditions, the variety has a significant yield advantage over other hybrids, thus enhancing its suitability in semi-arid zones within the sub-region. The variety performs better than small grains that are often grown by smallholder farmers in the drought-prone areas.

Read more about SIRDAMAIZE 113 at http://www.sirdc.ac.zw/index.php/bulletin and http://allafrica.com/stories/201210291347.html Contact Tarisayi Zvoma at tzvoma@sirdc.ac.zw for more details.

Source: Crop Biotech Update November 7, 2012

Contributed by Margaret Smith
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1.28 **Scientists develop witchweed resistant maize variety**

A new maize variety, known as TAN222, is believed to combat the parasitic flowering plant Striga spp. (also known as witchweed) that can make maize farming nearly impossible in some African regions particularly in Tanzania and Uganda. The new variety is the product of several years of joint research by the International Maize and Wheat Improvement Center (CIMMYT), the agrochemical producer and supplier BASF, and the Weizmann Institute of Science in Israel. According to Isaka Mashauri, director of Tanseed International which commercializes the witchweed resistant variety in Tanzania, the crop has also the advantage of producing high yielding outputs, harvesting 3.7 tons of maize per hectare. For more information, visit http://blog.cimmyt.org/?p=9525

Source: Crop Biotech Update November 7, 2012

Contributed by Margaret Smith
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1.29 **Scientists find Aphid resistance in black raspberry**

USDA scientist Chad Finn and colleagues discovered that black raspberries have resistance to the large raspberry aphid. They screened seedling from several wild raspberry populations for aphid resistance and found that strong resistance is present in three populations coming from Ontario, Maine, and Michigan. The aphid resistance in Maine and Ontario seems to be controlled by several genes, while the resistance in Michigan is controlled by a single gene. Identification of these resistance genes will help scientists to incorporate aphid resistance into commercialized varieties of black raspberry.

Read more at http://www.ars.usda.gov/is/pr/2012/121031.htm

Source: Crop Biotech Update November 7, 2012

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Mes25@cornell.edu

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1.30 **Indo-US consortium to develop drought tolerant pearl millet for Asia and Africa**

New hybrids to improve pearl millet yields under drought by deploying GM and non-GM technologies

Davis, California, USA and India

November 23, 2012

An Indo-US consortium from the University of California Davis, Arcadia Biosciences, ICRISAT, and Krishidhan Seeds announced today that they will develop heat and drought tolerant technology solutions in pearl millet. The public-private consortium will bring together expertise and technologies spanning breeding and molecular biology to develop climate resilient elite inbreds and hybrids. Lead by UC Davis, the consortium is funded by a four year grant from the US Agency for International Development (USAID) under the Feed the Future initiative for food security.

The team will harness breakthroughs enabled by a deeper understanding of plant responses to stress with modern genetic tools. UC Davis's expertise in the identification of metabolic and genetic pathways for plant stress tolerance will be combined with ICRISAT's expertise in field and drought tolerance trait assessment, and germplasm resources which will enable such breakthroughs. Arcadia Biosciences and Krishidhan Seeds will make technology available and support commercialization through public and private partners. This partnership will pyramid traits that will substantially increase yields over current elite hybrids and non-hybrid varieties grown by small resource poor farmers.

The consortium will introduce genes and gene combinations that have been shown to play key roles in conferring crops with the ability to grow and yield under the adverse environmental conditions (drought, salinity, high temperatures) that are typical of Africa and Asia. The USAID grant recognises the research potential of each partner in addressing agriculture productivity challenges especially in millets with sustainable solution, said Anup Karwa, Director of Krishidhan Seeds. Our efforts will lead to development of indigenous drought tolerant trait in pearl millet which will benefit Indian growers to tackle changing environmental constrains and usher higher productivity, Krishidhan believes.

http://www.seedquest.com/news.php?type=news&id_article=31653&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.31 **Scientists from Boyce Thompson Institute and USDA-ARS work together to develop global distribution map of tomato virus**

Itahca, New York, USA
November 13, 2012

Boyce Thompson Institute Scientist Zhangjun Fei has teamed up with scientists from across the country to generate a comprehensive global virus distribution map for tomatoes and develop breeders' tools to breed tomatoes and related fruits and vegetables with enhanced virus resistance.. Crop viruses have a worldwide distribution and have caused significant losses in field and greenhouse tomato, pepper, eggplant and other vegetable production. The National Institute of Food and Agriculture's (NIFA) Specialty Crop Research Initiative (SCRI) has funded the $1.3M study to develop the map and other tools to help reduce the impact of these viruses.

Dr. Zhangjun Fei will work with the project leader, Plant Pathologist Dr. Kai-Shu Ling from the USDA-ARS United States Vegetable Laboratory in Charleston, South Carolina. The pair work together to develop detection methods for new and emerging tomato viruses, identify the tomato genes responsible for virus resistance, and make this information available to plant breeders. The researchers hope that this will dramatically increase our understanding of how the virus is distributed globally and provide tools to predict and limit future epidemics.

The project is part of the USDA's focus on supporting research in plant breeding, genetics, and genomics to improve crops, identify and address threats from pests and diseases, and, create new technologies and tools for plant breeders.

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Source: Source: Boyce Thompson Institute

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1.32 **Researchers create potatoes with higher levels of carotenoids**

October 24, 2012
Washington, DC, USA

Potatoes with higher levels of beneficial carotenoids are the result of U.S. Department of Agriculture (USDA) studies to improve one of America's most popular vegetables.

Scientists with USDA's Agricultural Research Service (ARS) bred yellow potatoes with carotenoid levels that are two to three times higher than those of the popular Yukon Gold yellow-fleshed potato variety.

ARS plant geneticist Kathy Haynes and nutritionist Beverly Clevidence did the research at the agency's Henry A. Wallace Beltsville Agricultural Research Center in Beltsville, Md. Haynes works in the Genetic Improvement for Fruits and Vegetables Laboratory (GIFVL) at the Beltsville center, and Clevidence works in the center's Food Components and Health Laboratory. They published their findings in the Journal of the American Society for Horticultural Science.

ARS is USDA's principal intramural scientific research agency, and this research supports the USDA priority of promoting international food security.

Haynes found wild potatoes with intense yellow flesh that have about 23 times more carotenoids than white-flesh potatoes. By crossing these wild potatoes with cultivated types, Haynes and her colleagues developed the high-carotenoid potatoes.

In 2007, Haynes and her colleagues introduced a new potato named Peter Wilcox that they developed. The potato, which has purple skin and yellow flesh, has become popular in niche roadside markets. The overall carotenoid levels in this potato are more than 15 percent higher than those in Yukon Gold, according to Haynes.

Several carotenoids are involved, including neoxanthin, antheraxanthin, violaxanthin, lutein and zeaxanthin. Among these, lutein and zeaxanthin, are of keen interest for eye health; they appear to protect against age-related macular degeneration and perhaps against cataract formation.

Read more about this and other fruit and vegetable research in the October 2012 issue of Agricultural Research magazine.

http://www.seedquest.com/news.php?type=news&id_article=30799&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.33 **Some five hundred scientists have created a Top Ten list of plant-damaging fungi**

October 18, 2012
Spain

Almost 500 international experts have worked together to develop a ranking system of the ten most important phytopathogenic fungi on a scientific and economic level. The rice blast fungus (Magnaporthe oryzae) sits at the top of the list.

A survey conducted on 495 international researchers resulted in a list contaning the most important phytopathogenic fungi. Each researcher chose three that they thought to be most significant and the most voted then formed the list.

Said list has been published in the journal Molecular Plant Pathology and each one of the species mentioned is analysed by an expert in the field. One of those experts is the Spaniard Antonio Di Pietro from the department of genetics in the University of Cordoba. He describes the fungus Fusarium oxysporum which sits in fifth place on the list.

"Most of the pathogens on the list attack cereals like rice, wheat and maize. This is logical considering the huge importance of these crops in world agriculture", explains Di Pietro.

"Nonetheless, it is important to highlight the presence of the fungi in second and fifth place on the list (Botrytis cinerea and Fusarium oxysporum, respectively). These are generalist, wide-ranging pathogens which can cause damage in more than one hundred different crop species" the researcher adds.

Receiving almost double the votes of the second fungus, the first on the list is the rice blast fungus (Magnaporthe oryzae). Experts have highlighted the economic significance of this species as it can devastate rice paddies which are the food base for half the world's population.

In second place is the fungus 'botrytis bunch rot' or 'grey mould' (Botrytis cinerea). This impacts in a variety of areas as it is a wide-ranging pathogen. It is also one of the few species on the list that also has a beneficial use due to its role in some stages of wine production.

Threat to global agriculture

In third place are the species that include the genus Puccinia, which mainly affect wheat crops, whilst in fourth and fifth place are two species from the Fusarium genus (Fusarium graminearum and Fusarium oxysporum). The first of these mainly damages cereal plantations whilst the latter can affect very different crops such as tomato, cotton or banana.

Other cereal pathogens, namely Blumeria graminis and Mycosphaerella graminicola are in sixth and seventh place on the list. In eighth place are species from the Colletotrichum genus which in particular affect plants with economic importance such as fruit and ornamental plants.

The corn smut fungus or huilacoche (Ustilago maydis) is an edible fungus native to Mexico. This is in ninth place due to its scientific interest and not for its economic impact as it does not have particularly devastating effects. This species and that which sits in tenth place; Melampsora lini, have important uses in the study of the molecular bases of plant immunity and infection processes.

Di Pietro highlights that with this list "the authors are trying to inform the public about the importance of phytopathogenic fungi as they represent a growing threat to global agriculture".

Full bibliographic information:
Ralph Dean, Jan A. L. Van Kan, Zacharias A. Pretorius, Kim E. Hammond-Kosack, Antonio Di Pietro, Pietro D. Spanu, Jason J. Rudd, Marty Dickman, Regine Kahmann, Jeff Ellis and Gary D. Foster. Molecular Plant Pathology. Volumen 13, mayo de 2012. DOI: 10.1111/J.1364-3703.2011.00783.X

http://www.seedquest.com/news.php?type=news&id_article=30679&id_region=&id_category=&id_crop=

Source: Platforma SINC via SeedQuest.com

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1.34 **Astute companies are using corporate social responsibility initiatives to attract and engage top talent in a tight market. Part two of a three-part series on employee recruitment and retention.**

Joshua Cobb, a PhD student at Cornell University, wants to make a difference in the world. And in his chosen line of work, he might be able to do just that. As a plant breeder, Cobb is one of the precious few ag graduates companies are vying to recruit.

Just months from earning his PhD, Cobb is being courted by all the majors. Like other graduates in ag-related fields, he's a hot commodity in a seller's market. But he hasn't

let it go to his head—instead, he plans to leverage his position in the talent market to forward his own goals for social development.

“To find myself sitting in a position where large multinational companies are interested in what I bring to the table is really humbling. I look at it as an opportunity to leverage a little bit of the difference I want to make in the world,” says Cobb. “It’s harder to feel like you can be true to your own sense of social responsibility if you’re struggling to get a job in the first place. But if you have lots of different people vying to employ you, that gives you a little more freedom to concern yourself with how you want your career to impact the rest of your life.”

Cobb’s sense of social responsibility intensified after his travels in Argentina in 2001, which coincided with a period of tremendous political and economic turmoil for that country. “The peso crashed overnight … and the government literally went through seven presidents in less than seven days. Even martial law was instituted in many of the highly populated areas to control looting and riots,” Cobb explains. “I knew families who were already struggling to make ends meet and suddenly they had no money to buy food. One of the most striking scenes for me was watching a group of women who were banging empty pots and pans on the gates of Wal-Mart saying, ‘Let us in, let us in.’ They wanted access to the food locked behind those gates,” he says.

The scene left a deep and lasting impression on Cobb, who left the country with a renewed sense of purpose. “Whatever I did with my career, I wanted it to mean something,” he says. “I wanted it to mean something for people—for the alleviation of human suffering.”

Cobb found that purpose in plant breeding. “For me, plant breeding was biology made relevant. It was biology that had real economic consequences, and that’s what I was looking for.”

Now as Cobb examines his job options, he finds he’s in a position to consider more than just a paycheck.

“I approach my job search at the end of my PhD with a tremendous sense of social responsibility. In plant breeding, where jobs are plentiful, we don’t have to concern ourselves with salaries and compensation packages—those are a given, we know they will be good. Now, all of a sudden, our decision-making criteria fall upon concerns secondary to our economic needs—for me, part of that is social responsibility,” says Cobb.

A tight market for new talent allows graduates like Cobb to scrutinize companies’ social policies and responsibilities before signing on the dotted line. And they do. “I look at potential employers, and at some level I consider their formalized commitment to society and the environment, but I’m mostly looking for a venue that allows me the freedom to pursue crop improvement in a way that both meets my obligations to my employer, and their obligations to their shareholders, but also empowers my own goals of finding science-based solutions that contribute to the abolition of poverty and hunger,” Cobb says.

Social License

According to Darren Swanson, the International Institute for Sustainable Development’s Natural and Social Capital Program deputy director and Foresight Group program leader, social responsibility (also known as corporate social

responsibility) is an organization's accountability for the impacts of its decisions and activities on society and the environment through transparent and ethical behavior that is consistent with sustainable development and the welfare of society.

This definition is based on the International Organization for Standardization's ISO 26000 standard, he says, which provides guidance to both business and public sector organizations on social responsibility.

"It takes into account the expectations of stakeholders, is in compliance with applicable law and consistent with international norms of behavior, and is integrated throughout the organization," says Swanson.

"I see social responsibility as an organization taking a system's view—looking at its economic, social and environmental performance. It's a fairly well-accepted understanding there is a holistic set of issues that an organization should be planning around and reporting on to give the shareholder or the taxpayer the information they need to know about how the organization is performing—that's key."

Companies reporting on their social responsibility efforts benefit in many ways, says Swanson, such as positioning them with a social license to operate, increased competitiveness and trust from local stakeholders and communities, increased ability to deal with complex and dynamic situations—and employee attraction and retention. "My sense is that the new generation of employees coming out of school are pretty savvy with respect to social and environmental issues and are attracted to organizations that get the big picture—because *they* see the big picture," says Swanson.

Companies are looking at social responsibility in a new light, says Jeanne Meister, founding partner of Future Workplace and co-author of *The 2020 Workplace: How Innovative Companies Attract, Develop and Keep Tomorrow's Employees Today*, because a commitment to CSR can attract top talent. In the book, Meister quotes research conducted by Cone Communications from the *Cone Millennial Cause Study*, which indicated 80 percent of 1,800 13- to 25-year-olds want to work for a company that cares about how it impacts and contributes to society.

This year, research conducted by Future Workplace and reported in *Multiple Generations @ Work* found 69 percent of the 1,189 multiple-generation employees and 150 managers surveyed want to work for an organization whose values match their own. "This emphasis on CSR is now important beyond the Millennial segment of the workforce and is fast becoming one of the key levers for attractiveness to employees," says Meister.

A study conducted by Net Impact entitled *2020 Workplace: Preparing for the Future,* and noted in Meister's blog on Forbes.com, indicated 35 percent of the workers surveyed would take a 15 percent pay cut to work for a company committed to CSR; 45 percent would take that pay cut for a job that makes a social or environmental impact and 58 percent would take the pay cut to work for an organization with values like their own.

However, not only are companies using social responsibility as a driver to attract and keep the best and the brightest, but they are also using CSR as a tool for employee engagement.

“If you’re contributing to a cause, it impacts your level of engagement to your core job function,” says Meister. A recent survey by Advanced Micro Devices indicates 96 percent of its green team members agreed that contributing to a cause while at work improved their commitment and level of engagement to their core job function and to the company, notes Meister.

“If you care more about your job, you’re going to go the extra mile for your customers,” she says. “Companies are now focusing on tracking the connection between employee engagement and customer satisfaction.”

Employees at Bayer CropScience will go that extra mile for their customers, and in turn, for their employer. According to an internet survey on science careers by the journal *Science*, respondents highlighted Bayer’s social responsibility agenda—as well as high-quality research and employee loyalty—as reasons for Bayer’s status as one of the world’s top employers, says Utz Klages, an external communications manager for Bayer CropScience.

Bayer is heavily invested in its commitment to sustainability. One of Bayer’s corporate objectives is to achieve a balance between economic, social and ecological concerns within the context of its responsibility for the environment and society.

“Social commitment is an established part of Bayer CropScience’s sustainability strategy and corporate policy. We consider ourselves part of society and see our commitment as living up to the role of a good corporate citizen,” says Klages.

From food chain partnerships, which help growers produce high-quality food using the principles of sustainable agriculture, to agricultural education, numerous dynamic initiatives are underway at Bayer as part of its social responsibility platform.
“We view the promotion of worthy causes, such as agricultural education, as a long-term investment in society’s future viability, and as a contribution to a positive business environment propelling farming’s future,” says Klages. “In many parts of the world, we also promote educational opportunities for the next generation focused on agricultural science and raising awareness of the judicious use of natural resources such as land, soil and water.”

International Draw
Some companies are offering placements in countries with emerging markets—such as Brazil, Russia, India and China—as part of their recruitment packages to attract socially-minded talent. These programs, such as IBM’s Corporate Service Corps, offer participants life-changing experiences, building ‘global citizenship skills,’ while allowing the company to meet its own financial and social interests, illustrating a growing trend of companies making CSR strategic to its objectives.

“A number of companies that have created initiatives under the rubric of CSR are managed by the organization’s foundation to both build global citizenship and make it strategic so it’s actually using an employee’s skills in one of the countries around the world that the company has designated high growth within the next decade and aligning it to the recruiting objective.

“It’s a very big trend that companies are getting strategic around CSR. They’re saying, ‘If we’re going to devote resources and time, we want these aligned with our corporate priorities and use them as a driver to recruit and engage top talent,” says Meister.

For Cobb, an international placement may be the clincher to securing his talents. “It is really important to me to serve the component of the global population that I feel could really stand to benefit from high-yielding varieties and improved agricultural technology. That’s why, when I talk to prospective employers, the first thing I ask about is an international assignment.”

One company has already approached Cobb about working with a rice breeding operation in India. “I’m excited because if you look at India and you consider rice productivity, rice yields are about one-third of what they are in China. There’s a lot of progress to be made.

“I look at it as an opportunity where I can serve a company and their financial interests but do it in a way that’s parallel to the development interests of a growing population that struggles to feed itself. It’s a unique opportunity—it’s rare for the financial interests of a multinational organization to be in line with the goals of poverty alleviation and development,” says Cobb.

And once a company has successfully attracted top talent like Cobb, social responsibility initiatives may help to keep him. “I’m attracted to, and more likely to stay with, a company that works to connect its employees in collaborative networks that expand my own thinking—that nurture synergistic ideas. The bottom line for me is I want to work with an organization where I can build a career that supports, rather than competes, with my own sense of social responsibility and civic duty,” he says.

Kari Belanger

Keeping it Fresh

For companies doing business today, the generation of annual sustainability reports is the norm. These documents can be found on a company’s website, often as an attached PDF; however, reporting on sustainability efforts in this way is outdated, says Jeanne Meister, founding partner of Future Workplace and author of *The 2020 Workplace: How Innovative Companies Attract, Develop and Keep Tomorrow’s Employees Today*.

Companies wanting to communicate their social responsibility initiatives to attract new talent are using social media, such as Twitter and Facebook, to engage in conversations with prospective employees about CSR. Some companies are even creating their own apps. “Advanced Micro Devices has an app for the iPad that details its commitment to CSR,” says Meister. “It’s no longer buried in a 400-page PDF on the website. Companies are now communicating in the broadest way possible—on the iTunes store as an app.”

Another growing trend is for companies to use crowdsourcing to reach out to their employees to offer suggestions for new or updated social responsibility initiatives. “Crowdsourcing is being used as a tool to get more feedback from employees as to what other CSR efforts they can be working on,” says Meister

http://www.seedworld.com/index.php?option=com_content&view=article&id=530%3Asuccess-in-a-sellers-market-seed-world-october-2012&catid=96&Itemid=288

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Plant Breeding Academy

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1.35 **Unusual genetic structure confers major disease resistance in soybean**

Scientists have identified three neighboring genes that make soybean resistant to cyst nematode, its most important disease. The genes are found in the genetic structure called Rhg1, the preferred defense against cyst nematode and currently used on millions of soybean planted worlwide. In a study published this week in the journal Science, Rhg1 is shown to actually house three genes that work together to confer namatode resistance. Prof. Andrew Bent from the University of Wisconsin-Madison, together with graduate student David Cook and Matthew Hudson of the University of Illinois, said that plants with 10 copies of Rhg1 grew well in a nematode infested field. Professor Bent added that "what confers the resistance is higher expression of all three genes, and not a mutation in the genes." The findings of their study will help soybean breeders identify genes needed for resistance and quickly identify resistant plants, speeding the quest to breed soybeans with stronger nematode resistance. The news release is available at http://www.news.wisc.edu/21153

Source: Crop Biotech Update October 31, 2012

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1.36 **Max Planck Institute for Plant Breeding Research awarded grant to study the structure, function and evolution of plant root-inhabiting bacterial communities**

Germany
November 12, 2012

European research council (ERC) awarded an ERC advanced grant to Paul Schulze-Lefert

Paul Schulze-Lefert, Director of the Department of Plant-Microbe Interactions at the Max Planck Institute for plant breeding research in Cologne was awarded an ERC advanced grant from the European research council (ERC) to study the structure, function and evolution of plant root-inhabiting bacterial communities.

These bacterial communities, also called root microbiota, are selected by plant roots from the surrounding soil biome.

Preliminary evidence suggests that root microbiota members promote both plant growth and plant health.

The former beneficial function is likely mediated by the mobilization of soil-borne nutrients such as nitrogen and phosphate for uptake by plant roots. The latter function is thought to be mediated by microbiota members that provide indirect protection against colonization by soil-born microbial plant pathogens, including fungi.

“The importance of root microbiota for plant growth and plant health has been recognized only recently", says Schulze-Lefert.

"We are glad that the ERC advanced grant gives us the opportunity to systematically explore this emerging research area.”

The research funds are initially awarded for a period of five years.

http://www.seedquest.com/news.php?type=news&id_article=31612&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.37 **Barley genome unraveled**

United Kingdom
October 19, 2012

An international consortium of scientists has published a high resolution draft of the barley genome in the journal Nature. The research will help to produce new and better barley varieties that are vital for the beer and whisky industries. The UK team behind the research was led by Professor Robbie Waugh of Scotland’s James Hutton Institute who worked with researchers at The Genome Analysis Centre, Norwich.

Barley is the second most important crop in UK agriculture and malting barley (some 30% of the total) underpins the beer and whisky sector that is worth some £20 billion to the UK economy. The breakthrough is a critical step towards barley varieties able to cope with the demands of climate change. It should also help in the fight against cereal crop diseases that cause millions of pounds of losses annually.

Barley is the world’s fourth most important cereal crop both in terms of area of cultivation and in quantity of grain produced. In addition to whisky and beer, barley is also a major component of the animal feed that underpins the meat and dairy

industries. Barley straw is a source of nutrition for ruminants, used for animal bedding in the winter, and used for frost protection in horticulture.

The barley genome is almost twice the size of that of humans and determining the sequence of its DNA has presented a major challenge. This is largely because its genome contains a large proportion of closely related sequences that are difficult to piece together into a true linear order.

By developing and applying a series of innovative strategies that allowed them to circumvent these difficulties, the International Barley Genome Sequencing Consortium (IBSC), including UK researchers in Dundee and Norwich and funded by the Biotechnology and Biological Sciences Research Council (BBSRC) and Scottish Government, has managed to construct a high resolution draft DNA sequence assembly that contains the majority of barley genes in linear order.

Their publication provides a detailed overview of the functional portions of the barley genome, revealing the order and structure of most of its 32,000 genes and a detailed analysis of where and when genes are switched on in different tissues and at different stages of development. They describe the location of dynamic regions of the genome that, for example, contain genes conferring resistance to diseases. This will provide a far better understanding of the crop's immune system. The achievement also highlights with unprecedented detail the differences between several different barley cultivars.

Professor Waugh commented: "Access to the assembled catalogue of gene sequences will streamline efforts to improve barley production through breeding for varieties better able to withstand pests and disease and deal with adverse environmental conditions such as drought and heat stress.

"It will accelerate research in barley, and its close relative, wheat. Armed with this information breeders and scientists will be much better placed to deal with the challenge of effectively addressing the food security agenda under the constraints of a rapidly changing environment."

Commenting on the importance of this publication, Professor Douglas Kell, BBSRC Chief Executive said: "This provides a timely and important new tool for unlocking the potential of better varieties of barley that are able to cope with environmental stresses or produce higher yields. It is an exceptionally valuable step for UK agriculture at a time when we have seen huge losses in the field due to wet weather and price-rise predictions for the consumer."

The IBSC was founded in 2006, and includes scientists from Germany, Japan, Finland, Australia, the United Kingdom, the United States and China. The genome sequence and related resources are freely accessible online.

Background
Paper: A physical, genetic and functional sequence assembly of the barley genome. The International Barley Genome Sequencing Consortium. Nature, 18 October 2012.

Barley is the second most important crop in UK agriculture. Malting barley (some 30% of the total) underpins the beer and whisky sector that is worth some £20 billion to the UK economy with almost £5 billion flowing directly to the treasury as duty. Lower quality grain and by-products of the malting process are a major component of the

animal feed that underpins the meat and dairy industries and barley straw is a source of nutrition for ruminants, is used for animal bedding in the winter and for frost protection in horticulture. In social terms, barley cultivation and its use in the whisky industry indirectly supports up to 40,000 families in Scotland, largely in rural communities. Over the past 50 years barley grain yields, have more than doubled with recent analysis revealing that greater than 90% of this improvement can be attributed to genetics

http://www.seedquest.com/news.php?type=news&id_article=30708&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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1.38 **Wageningen scientists discover genetic factor that makes barley plants resistant to salt**

Wageningen, The Netherlands
October 30, 2012

Barley breeders may soon develop varieties of barley which are both less sensitive to high concentrations of salt ions in the plant and more resistant to osmotic stress caused by saline soil. Nguyen Viet Long, who hopes to obtain his doctorate at Wageningen University (part of Wageningen UR) on 2 November 2012, has found two sequence regions in the chromosomes of barley that contain the genes for these two properties. The section comprising resistance to osmotic stress in particular is receiving a great deal of international attention from scientists working on salt tolerance. Nguyen is hoping that barley varieties which can be cultivated in saline soils will reach the market within around five years, thanks in part to his results.

Salinisation of agricultural land is a global problem. An area two hundred times the size of the Netherlands has already become too saline to use for food production. One fifth of this represents some of the best irrigated farmlands in the world. And climate change is aggravating the problem even further.

This is why researchers and plant breeders around the world are looking for opportunities to develop salt-tolerant crops for arable farming and horticulture. Of course this mostly focuses on the major food crops such as grains and potatoes. The Vietnamese PhD student Nguyen examined the possibility of adapting barley to saline conditions. Since barley is a grain, many of the results of this research will be useful to scientists studying wheat or rice. Nguyen worked together with the Leibniz-Institut für Pflanzengenetik und Kulturpflanzenforschung (IPK) in Germany, which has a large collection of different varieties of barley. Nguyen examined some two hundred different varieties, including barley types from the Middle East. This is the area where barley originated, which means that large genetic variation can be found there – and the greater the genetic variation of examined varieties, the higher the chance of finding genetic factors that can be used in plant breeding.

Being able to investigate so many different types of barley enabled Nguyen to determine the positions of the important hereditary properties faster and more

accurately. In his research, Nguyen studied the growth of barley plants in high salt conditions. He looked at a number of plant characteristics that are important for salt tolerance such as delayed yellowing of leaves, number of shoots and ion content in the leaves. By linking these observations to DNA analysis, he found two positions in the barley genome that affect the plant's resistance to salt.

One of the two areas, on chromosome 4, affects how the plant deals with increased concentrations of salt ions such as Na+ and Cl-. The plant uses a kind of 'ion pump' to prevent these elevated ion concentrations from reaching the leaves. This allows the photosynthesis in the leaves to continue as normal, permitting the plant to continue growing and producing seeds. The discovery of a similar mechanism in wheat was in the news quite recently.

The second area identified by Nguyen, on chromosome 6, contains one or more genes that make barley plants less sensitive to osmotic stress, which is the result of the high concentration of ions in saline soil. In this situation, plants absorb water less easily, which directly affects growth of the plants. This discovery is a real breakthrough, and has led to considerable international interest. The precise genes responsible for salt tolerance in barley will probably be identified soon. "Examining the genetic makeup and salt tolerance of so many different types of barley enabled me to map the interesting areas quickly and accurately," Nguyen explains. "I am therefore hopeful that we will have barley varieties that can be grown on saline soils within around five years " This research was funded by Wageningen UR Plant Breeding and the Vietnamese Ministry of Education.

http://www.seedquest.com/news.php?type=news&id_article=30934&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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2 PUBLICATIONS

2.01 Of the Latvian Academy of Sciences. Section B, Vol. 66 (2012), No. 4/5 (679/680), pp. 20–30.

Swimming in the breeding pool partnering for conservation of plant genetic resources through crop germplasm enhancement

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Communicated by

*Substantial and sustainable increases in productivity of all crops are needed to meet the predicted demand for food, feed, fibres, flowers, fuels, fun, feed-stocks and pharmaceuticals of this 21*st *century bio-based economy. Plant breeding is vital for*

protecting the yield gains made to date, and for further increasing the genetic yield potential of all crops. As a result of the Green Revolution, global productivity of the main food staples steadily rose since the 1960s. Such achievements ensued from crop genetic enhancement partnerships. They are models for illustrating partnering for exchange, evaluation, release and use of plant genetic resources worldwide. These partnerships include national agricultural research institutes and international agricultural research centres. For many decades the global wheat yield increased due to an effective International

Wheat Improvement Network (IWIN), which deployed cutting-edge science alongside practical multi-disciplinary applications, resulting in the development of bred-germplasm that has improved food security and the livelihoods of farmers in the developing world. IWIN operates field evaluation trials in more than 250 locations of 100 countries for testing breeding wheat lines across many environments. The International Network for Genetic Evaluation of Rice (INGER) has become an integral component of rice breeding programmes: every year partners provide about 1000 genetically diverse breeding lines, which have been grown in about 600 experiment stations from 80 countries. The Latin American Maize Programme (LAMP) has assessed national germplasm, facilitated the exchange of genetic resources across the continent, and its core subset has been made available to encourage further use in broadening maize genetic resources. For example, the Germplasm Enhancement of Maize (GEM) project has used LAMP-selected landraces in crosses with elite temperate maize lines provided by North American private companies,to introgress useful genetic diversity into US maize germplasm, with the aim to broaden the genetic base of "corn-belt" hybrids.

Key words: *CGIAR, maize, pre-breeding, rice, wheat.*

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2.02 **'Seeds. Physiology of Development, Germination and Dormancy', 3rd Edition**

Davis, California, USA November 22, 2012

The book '**Seeds. Physiology of Development, Germination and Dormancy**' 3rd Edition, by J. Derek Bewley, Kent J. Bradford, Henk W. M. Hilhorst and Hiro Nonogaki is now available from Springer in softcover printed form, or as an e-Book.

See details on the publisher's webpage
http://www.springer.com/new+%26+forthcoming+titles+%28default%29/book/978-1-4614-4692-7

This replaces the previous editions by Bewley and Michael Black.

This new edition has been extensively updated and incorporates much of the progress that has been made over the past two decades in the areas of molecular and cellular biology of development and germination, as well containing new ideas and approaches with respect to dormancy, ecophysiology, desiccation tolerance, storage and longevity. As with the previous editions, information is placed in the 'big picture' context of the seed, and will be an invaluable source of information for students,

researchers, teachers and those interested in understanding the complexities of seed biology.

Published: November 22, 2012

http://www.seedquest.com/news.php?type=news&id_article=31646&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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2.03 **Announcement on the publication on "Case Studies of use of Agricultural Biotechnologies in Developing Countries"**

October 18, 2012

Dear colleagues,

As a follow up to its 2010 International Conference on Agricultural Biotechnologies in Developing Countries (ABDC-10, http://www.fao.org/biotech/abdc/en), the Food and Agriculture Organization of the United Nations (FAO) is in the process of preparing a short publication on "Case Studies of use of Agricultural Biotechnologies in Developing Countries".

The aim of this proposed publication is to document and disseminate high impact and/or teachable instances where non-GMO agricultural biotechnologies are, and have been, used to serve the needs of smallholder farmers in developing countries in the crop, forestry, livestock and fisheries sectors. It will target a non-technical audience and will cover the different areas in which biotechnologies are applied - such as to improve yields; characterize/conserve genetic resources; diagnose diseases; and develop vaccines etc. FAO's definition of biotechnology is quite broad (see http://www.fao.org/biotech/biotech-forum/conference-16/en/) but this particular endeavor excludes the applications of genetic transformation.

For the crops sector, the publication will include five case studies (maximum of 2000 words each) on the application of agricultural biotechnologies to crop production and protection (i.e. breeding, genetics, characterization, reproduction, physiology, multiplication of planting materials, diagnostics, pathology, etc.).

FAO is opening a competition to identify the five case studies and the writers that will document them. The selected authors will each receive a small honorarium and will have their authorship reflected on the publication.

To participate in the competition, interested persons are requested to send a title and abstract (max. 300 words) describing the case study. The abstract must specify the biotechnology (or biotechnologies) applied, the crop(s), the geographic location, the smallholder beneficiaries, the impact (or lack thereof) and lessons learned to Kakoli.Ghosh@fao.org or Chikelu.Mba@fao.org. The authors of the selected abstracts will subsequently be asked to prepare the full case study document (i.e. maximum 2000 words) that would preferably include relevant photos and charts.

Interested colleagues should please note that the case studies do not necessarily have to represent successes. Multiple abstracts may be submitted per person, as long as they refer to distinct case studies. One criterion for the selection of the case studies will be diversity so that the widest spectrums possible of applications, geographical locations, crops, etc. are covered for each sector.

The dates of importance for this competition are as follows:

1. 10 November 2012 - deadline for submission of abstracts
2. 20 November 2012 - notification of results of the selection process
3. 31 December 2012 - submission of first draft of case-study
4. 31 January 2013 - submission of final draft and arrangement of payment for services rendered

Requests for clarification or other inquiries may be sent to Chikelu.Mba@fao.org

Kakoli Ghosh and Chikelu Mba Plant Genetic Resources and Seeds Team, Plant Production and Protection Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, 00153 Rome, Italy Telephone: +39 (06) 57 05 62 65; Fax: +39 (06) 57 05 30 57
Source: Plant Genetic Resources and Seeds Team, Plant Production and Protection Division, Food and Agriculture Organization of the United Nations via Plant Breeding News

http://www.seedquest.com/news.php?type=news&id_article=30682&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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2.04 **Amazing Close Ups of Seeds**

November 9, 2012

About an hour south of London, in Sussex, scientists at the Royal Botanic Gardens, Kew, are preparing seeds for storage. Researchers at 48 partner institutions in 16 countries collect seeds and send them to Kew, where the specimens are cleaned, dried for about a month and then stored for perpetuity in an underground vault, kept at a chilly -20 degrees Celsius. The Millennium Seed Bank, as it is called, was founded in 2000 as an effort to stock away viable seeds, now, should we need them to restore plant populations in the future. Nearly 100,000, or about one quarter, of the world's plant species, are currently threatened. "We can't afford to let these plants, and the potential they hold, die out," says Kew, on its Web site.

The Millennium Seed Bank is a global seed garden of epic proportions. By 2010, the project had amassed about 10 percent of the world's 400,000 plant species, and the trajectory is to reach 25 percent by 2020.

Wouldn't you like to see it? The vault itself, of course, is hidden from the public eye. But, MSB's seed morphologist Wolfgang Stuppy and visual artist Rob Kesseler have come up with a clever workaround.

In a new book, *Seeds: Time Capsules of Life* (Insight Editions), Stuppy tells the story of seeds and seed evolution with the extraordinary visual aid of Kesseler's gorgeous images of specimens from the collection. To capture their exquisite structures, Kesseler takes seeds just millimeters in size and magnifies them tens and hundreds of times under a scanning electron microscope.

The seeds featured in the book represent the great diversity in the plant kingdom. Over 360 million years, seeds have evolved in both their form and function. Today, seeds range in size from the Seychelles nut, which weighs 44 pounds, to the miniscule seeds of wild orchids, where, in a single gram there can be two million. "The smaller they are, the more intricate and crazy their surface patterns are," says Stuppy. Seeds disperse by wind, water or by hitchhiking on animals, and they have the wings or barbs to do so. "We tried to take the most exciting examples that illustrate the way seeds have adapted to do their job," adds Stuppy.

As an artist, Kesseler has always been inspired by the natural world. He started working with microscopic plant material in the early 2000s, when he was a NESTA fellow at Kew. To create his scanning electron micrographs, he places an individual seed on an aluminum stub specimen mount, about the size of a dime. The seed is coated with a microfine layer of gold or platinum and put into a vacuum chamber, where it is bombarded with electron particles. The electron beam measures the seed's surfaces and translates these measurements into a digital image.

"You can take a seed, measuring a millimeter, and make it look like a Volkswagon Beetle," says Stuppy. The resulting picture is big, sharp and has a hyper-realistic quality. "You can't do this with any other method," he says.

In post-production, Kesseler cleans up the black-and-white images, pixel by pixel, with a graphic tablet and pen. Then, in Photoshop, he adds color. "People often ask, 'Is that the real color?'" says Kesseler. " And, I'll say, 'Well, no.' But, I am introducing the color based on looking at the original plant—the flowers, the leaves." In an image of a sand milkwort, for instance, he colors the main portion of the seed green and the funky tuft of hair at the top pink, to match the color of the flower it actually produces. He tends to highlight different functional characteristics of the seed by color in the process. "Plants use color to attract an audience of insect collaborators. I use it to attract an audience of humans," says Kesseler.

Botanists, who have had scanning electron microscopes at their disposal for decades now, are familiar with the amazing shapes and ornamentations of seeds. But, Stuppy claims that *Seeds* is the first attempt of its kind to share this microscopic world with a wider public audience.

"The beauty comes first," says Stuppy. "The fact that it is a seed is secondary." Kesseler agrees. "They have a disturbing sense of familiarity," he says. The seeds are vaguely recognizable as some sort of life form. "But you are not quite sure," he adds. "You respond to them visually, as an impact, and then you are drawn to ask, what is this?"

If viewers are curious enough, the hope is that they will read about the plants. Then, once people learn about plant species on a deeper level, perhaps they will come to understand how profoundly important it is to save them. According to Kew, humans are the reason that many of the nearly 100,000 threatened plant species are in danger of extinction.

“If you want to achieve any change in the public, science alone can’t achieve that. You can tell people a lot about climate change; rationally, they can grasp it. But, hardly anyone does anything,” says Stuppy. “Science goes for the head. The real change has to come from the heart. Art goes for the heart.”

http://blogs.smithsonianmag.com/artscience/2012/11/amazing-close-ups-of-seeds/

Source: SeedQuest.com

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3. WEB AND NETWORKING RESOURCES

3.01 **Wintersteiger's new Easy Plant and Easy Harvest software – one field plan for the whole year**

Ried, Austria
Novmeber 2012

The new sowing software Easy Plant and the new harvesting software Easy Harvest offer, for the first time, a uniform user interface for machine operation in agricultural trials. Field plans have to be created only once and can be used for both sowing and harvesting.

The uniform user interface of Easy Plant and Easy Harvest simplifies the operation considerably. A detachable computer can be used on the precision spaced planter as well as on the combine; therefore, software and computer need to be purchased only once.

Easy Plant Planting software

Easy Plant is used in the precision spaced planter Dynamic Disc, making it simple to plan and carry out your planting. Easy Plant offers one particular advantage: The entire creation of field maps can be done during the months before the planting. This includes both simple trial arrangements and the planning of the seeding rate per plot.

Your benefits summed up:

Simple and convenient operation

- Clear menu navigation and intuitive operation in various languages
- Simple creation of field maps and trial arrangements prior to planting
- Planting of several trials in a field in a single operation
- Different planting rates for each plot without manual adjusting
- Additional information can be added to the plots as notes

- Simple import and export of data

High precision, reliability, traceability

- Documentation of the actual number of seeds planted per row
- Integrated barcode scanner (optional)
- Ability to manually control the processes („seed recovery“)
- Data protection through additional backup file (e.g. USB stick)
- Error diagnosis system and remote error diagnosis
- Allows for several users with different right

Easy Harvest
Harvesting Software

Collecting, managing and protecting data have become the focus of the processes of agricultural field trials. Easy Harvest is used on the harvester in connection with a mobile harvesting data system and enables highest precision weighing and moisture measuring. Above all, Easy Harvest offers the advantages of high operational reliability and allows you to harvest several trials in a field in a single operation.

Your benefits summed up:

High precision, reliability, traceability

- Clear and user-friendly menu-driven operation in different languages
- Simple creation of field plans and trial arrangements
- Harvesting of several trials in a field in a single operation
- Additional information can be added to the plots as notes
- Precalibrated moisture curves
- Simple import and export of data

Easy and convenient operation

- Precise weighing result and moisture measurement
- Integrated sampling control
- Integrated label designer and label printer
- Data protection through backup file (e.g. USB stick)
- Ability to manually control the processes
- Error diagnosis system
- Allows for several users with different rights

http://www.seedquest.com/news.php?type=news&id_article=31636&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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4. GRANTS AND AWARDS

4.01 PhD opportunities for bioscience graduates at the John Innes Centre

Norwich, United Kingdom
October 25, 2012

The John Innes Centre is offering a number of PhD projects through the new Norwich Biosciences Doctoral Training Partnership (DTP) programme which involves five world-class research institutions based on the Norwich Research Park. This new PhD training programme is supported by Biotechnology and Biological Sciences Research Council (BBSRC) who recognise Norwich as a major centre for biosciences research in the UK. We offer talented biosciences graduates an opportunity to work in a multidisciplinary research environment and join a vibrant student community.

With major advances in 'omics and a wide range of new analytical techniques it is a particularly exciting time to set out on a career in biosciences research. The global challenges of the 21st century are enormous, and advances in the biosciences offer real opportunities to address topics such a food security, new sources of energy and development of sustainable sources for chemical products. It is against this background that the BBSRC has funded 14 new biosciences PhD programmes in the UK, of which the Norwich DTP is one.

The Norwich DTP is unique in bringing together the resources of five world-class research institutions on a single site – the Norwich Research Park. As a consequence, students joining the Norwich programme will have the opportunity, within a single programme, to pursue multidisciplinary research encompassing everything from atomic level structural studies, through computational and systems biology, to large scale crop field trials.

For more information on the Norwich Biosciences Doctoral Training Programme, details of the current projects being offered, and more information on how to apply, please see: http://www.biodtp.norwichresearchpark.ac.uk/

To find out more about JIC PhD student programmes see:
http://www.jic.ac.uk/students/PhDprogs.htm

These new projects are funded under the BBSRC Doctoral Training Partnership Scheme, which was announced in January. The Norwich Biosciences DTP is one of 14 across the UK and will eventually see over 600 PhD projects across the Norwich Research Park over a three year period. The John Innes Centre is coordinating this programme, which also involves the University of East Anglia, The Sainsbury Laboratory, The Institute of Food Research and The Genome Analysis Centre.

http://www.seedquest.com/news.php?type=news&id_article=30867&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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5. POSITION ANNOUNCEMENTS

5.01 **Monsanto plant breeding and related scientist positions:**

Requires a Ph.D. or M.S. in plant breeding and genetics, or related fields
For more information: http://jobs.monsanto.com/ or www.monsanto.com/careers

USA
Line Development Breeder - Flora, MS - Job ID: 009TD
DH Optimization Lead - St. Louis - Job ID: 002CJ
Automation Lead Engineer - Huxley IA - Job ID: 002CH
Soybean Discovery Scientist - Iowa - Job ID: 008IW
Soybean Discovery Breeder - Galena, MD - Job ID: 008LP
DH System Improvement Lead (Vegetables Division) - Woodland, CA - Job ID: 005ES
Soy Pathology Lead - St. Louis - Job ID: 007LR
Trait Integration Breeder - North America - Job ID: 009B0
Field Research Conversion Manager - Juana Diaz, Puerto Rico - Job ID: 008L7
Cotton Breeding Purity Lab Manager - St. Louis - Job ID: 005ML
DH Optimization Scientist St. Louis - St. Louis - Job ID: 009F2
Native Trait Development Lead – St. Louis, MO – Job ID: 009EW
- bioinformatics, big data, statistical genetics, modeling, etc.
Environmental Modeling Scientist - St. Louis - Job ID: 0086W
Statistical Geneticist - St. Louis - Job ID: 008EA
Data Curator and Analyst - St. Louis - Job ID 004ZI
Scientific Business Analyst - St. Louis - Job ID: 006P0
Bioinformatics Scientist - Woodland CA - Job ID: 00899

Israel
Pepper Breeder (Vegetables Division) - Israel - Job ID: 005OG

Asia
Philippines
Line Development Breeder – General Santos City, Philippines – watch for upcoming posting

India
Trait Geneticist (Vegetables) - Bangalore, India – watch for upcoming posting
PANSEA and India Data and Marker Lead – Bangalore, India - Job ID: 00B0L
Asia Trait Integration Breeder - India - Job ID: 007TQ
Hot Pepper Breeder - Maharashtra, India - Job ID: 007E3
Research Scientist (Entomology) - Bangalore, India - Job ID: 004RC
Testing & Operations Manager 3 – Bangalore, India- Job ID: 008AP

China
Commercial Breeder - China - Job ID: 008OW
Hot Pepper Breeder - China - Job ID: 006NS
Tomato Breeder - China - Job ID: 006NQ
Cucumber breeder - China - Job ID: 006NY
Tropical Sweet Corn Breeder - China/Thailand - Job ID: 009XT

Latin America
LAN Corn Breeding Data and Marker Manager - Tlajomulco de Zuniga, Jalisco, Mexico - Job ID: 005P0
LDB Breeder - Rolândia, Paraná, Brazil - Job ID: 00AR1
Research Associate IV - Santa Helena de Goiás, GOIÁS, Brazil - Job ID: 0095U

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6. MEETINGS, COURSES AND WORKSHOPS

New listings may include some program details, while repeat listings will include only basic information. *Visit web sites for additional details.*

This section includes three subsections:

A. DISTANCE LEARNING/ONLINE COURSES
B. COURSES OF THE SEED BIOTECHNOLOGY CENTER AT UC DAVIS
C. OTHER MEETINGS, COURSES AND WORKSHOPS

A. DISTANCE LEARNING/ONLINE COURSES

Distance Education in Plant Breeding at Texas A&M

Available Degrees:

Master of Science in Plant Breeding (Non-Thesis Option)

Master of Science in Plant Breeding (Thesis Option)

Requirements Leading to the Master of Science Degree

1. 32 graduate credit hours beyond the B.S. degree; general requirements are:
a. 23 course hours approved by the student's advisory committee and the Office of Graduate Studies.
b. Statistics 651 or equivalent.
c. An exit seminar discussing research findings (SCCS 681).
d. No more than 8 hours of SCSC 691 (Research) or SCSC 685 (Directed Studies).
e. No more than 9 hours of upper level (300 or 400) undergraduate courses and no graduate credit for the following courses required for a B.S. degree:
SCSC 101
SCSC 105
SCSC 301
f. See Graduate Catalog for additional requirements, http://tamu.edu/admissions/catalogs/.
2. A thesis written on original research as directed by student's advisory committee.

Time for Completion
Time for completion will vary depending on number of courses taken per semester and the student's original research project. Typical completion time will be 3-5 years.

Course Delivery
Each course has been uniquely designed by the instructor to provide course content in an accessible, understandable format. All courses will be delivered on-line, completely at a distance via Texas A&M University's E-learning system. This system utilizes the Blackboard Vista learning platform to allow students to view instructional materials, interact with other students and faculty, and complete assignments and examinations. *(To check your computer's compatibility with this system visit Texas A&M's E-Learning and perform the E-Learning Browser Check.)* The web based

nature of course delivery allows students to access and complete course material at a time convenient to them.

For thesis option MS students, graduate advisory committee meetings, examinations, and research defense will be handled through electronic communication, including video and teleconferencing. **No campus visit will be required.**

Admission Procedure
Applicants should follow all of the guidelines and procedures to apply for graduate studies in a department offering a plant breeding degree at Texas A&M University at College Station using the Texas A&M on-line admission process. On-line application to graduate studies at Texas A&M University can be found at admissions.tamu.edu. The Department of Soil & Crop Sciences and the Department of Horticultural Sciences confer graduate degrees in plant breeding.

Additional items to be provided by the applicant:
Non-Thesis Option

- A letter of application directed to Wayne Smith, David Byrne, or LeAnn Hague providing sufficient background information to demonstrate the student's commitment and ability to complete an on-line Master of Science (NTO) program and internship, including prospective internship location or activity.

Thesis-Option
- A letter of application directed to Wayne Smith, David Byrne, or LeAnn Hague providing sufficient background information to demonstrate the student's aptitude to conduct plant breeding research.
- Identification of the area of plant breeding research to be pursued and its importance to the agricultural industry.
- A one or two-page letter of support from the perspective distance co-chair indicating commitment of facilities and time for the conduct of the proposed research.

Students applying to the *Department of Soil and Crop Sciences* must send these additional items to the attention of Wayne Smith, Department of Soil and Crop Sciences, 2474 Texas A&M University, college Station, TX 77843-2474 (cwsmith@tamu.edu).

Students applying to the *Department of Horticultural Sciences* must send the additional items to the attention of David Byrne, Department of Horticultural Sciences, 2133 TAMU, College Station, TX 77843-2133 (dbyrne@tamu.edu).

Course Name Credit Hours
SCSC 304: Undergraduate Plant Breeding 3
SCSC 306: Crop Production 3
SCSC 422: Soil Fertility 3
SCSC 641: Plant Breeding 3
SCSC 642: Quantitative Plant Breeding 3
SCSC 643: Quantitative Genetics 3
SCSC 654: Genomic Analysis 3
SCSC 660: Experimental Designs 3
STAT 651: Statistics I 3
STAT 652: Statistics II 3

STAT 653: Statistics III 3
AGEC 314: Marketing Agriculture Production 3
EHRD 602: Human Resource Development 3
EHRD 605: Leadership 3

The above information is available in a downloadable format at
http://soilcrop.tamu.edu/graduateprogram.html

Contact Information
For more information contact:

Wayne Smith
Department of Soil and Crop Sciences
2474 TAMU
College Station, TX 77843-2474
Tel. 979.845.3450 Fax 979.458.0533
cwsmith@tamu.edu

David Byrne
Department of Horticultural Sciences
2133 TAMU
College Station, TX 77843-2133
Tel. 979.862.3072
dbyrne@tamu.edu

LeAnn Hague
Distance Education Coordinator
Department of Soil and Crop Sciences
2474 TAMU
College Station, TX 77843-2474
Tel. 979.845.6148 Fax 979.458.0533
Leann.hague@tamu.edu

Additional Website
eLearning at Texas A&M University: http://elearning.tamu.edu/

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University of Nebraska-Lincoln launches online plant breeding and genetics certificate program

http://www.seedquest.com/news.php?type=news&id_article=27326&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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Plant Breeding Methods - Distance Education version CS, HS 541-section 601 DE; 3 credits; lecture only

For more information http://distance.ncsu.edu/courses/fall-courses/HS.php

For more information on distance education at NC State University, see:
http://distance.ncsu.edu/

For more information on Todd Wehner, see:
http://cucurbitbreeding.ncsu.edu/

Plant Breeding Overview - Distance Education version HS 590-801,601; 1 credit; lecture only

For more information on HS http://distance.ncsu.edu/courses/fall-courses/HS.php

Dr. Todd C. Wehner
Professor and Cucurbit Breeder
Department of Horticultural Science
North Carolina State University
Raleigh, NC 27695-7609
919-741-8929
tcwehner@gmail.com

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Master of Science in Plant Breeding at Iowa State University (distance program)

Contact information is:
msagron@iastate.edu
toll-free: 800-747-4478
phone: 515-294-2999
http://masters.agron.iastate.edu

Maria Salas-Fernandez
Assistant Professor
Department of Agronomy
Iowa State Univ.
msagron@iastate.edu

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Online Graduate Program in Seed Technology & Business

Iowa State University
http://click.icptrack.com/icp/relay.php?r=48323218&msgid=597705&act=BDP

Contact us today for more information about how you can apply:

Paul Christensen
Seed Technology and Business Program Manager Ph
515-294-8745
seedgrad@iastate.edu

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B. COURSES OF THE SEED BIOTECHNOLOGY CENTER AT UC DAVIS

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December 3-7, 2012, **Seed Business 101–Horticulture**

Registration is open for the Davis course.

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(NEW) *January 22 – 23, 2013*, **Seed Captain**

Plans are underway for two new offerings at the Seed Biotechnology Center. A new module in the **Seed Captain** series of the International Seed Academy will be offered for the first time in the US and is targeted to experts and professionals in seed technology. This advanced course will cover the latest technologies for seed coatings, seed identification, systemic markers and related topics. Tentative dates are January 22 – 23, 2013.

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January 28-February 1, 2013, **Seed Business 101-Seed Biology, Production and Quality**, Davis, CA

For more information, registration and all courses details please visit: http://sbc.ucdavis.edu/ the PBA website.

You may also contact Jeannette Martins at jmartins@ucdavis.edu., or Joy Patterson at jpatterson@ucdavis.edu

Contributed by Susan DiTomaso
sbc-enews
scditomaso@ucdavis.edu

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(NEW) *February 19-21, 2013*, **Program Management for Plant Breeders**

Program Management for Plant Breeders will teach the principles of employee and resource management in a modern agricultural research program. This course is designed for professionals directing plant breeding and laboratory programs. The session is scheduled for February 19-21, 2013. More information on both courses will be available soon. In the meantime, if you have questions, please contact Susan DiTomaso.

http://www.seedquest.com/news.php?type=news&id_article=31273&id_region=&id_category=&id_crop=

(NEW) *February 12-14, 2013*, **Seed Biology, Production & Quality**
This course has been expanded to include both hands-on exercises and detailed discussions of seed production and seed technology. Topics include: Flowering and

pollination, seed development and maturation, production and certification, health and phytosanitation, harvesting and conditioning, vigor and viability, storage and longevity, biotechnology and seed enhancement.

Participants also have the opportunity to attend Seed Central Research and Technology, Brainstorming and Forum events on the afternoon of February 14th. For more information see Seed Central. For questions and additional information go to SBC or contact Jeannette Martins.

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(NEW) *October 2013*, **Class III of the European Plant Breeding Academy**
Registration is now open for Class III of the **European** Plant Breeding Academy. This program begins in October 2013. There is an early-bird registration discount available until March 31, 2013. For more information on the European Plant Breeding Academy contact Joy Patterson or visit the PBA.

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European **Plant Breeding Classes**

For more information and application process visit
http://pba.ucdavis.edu/PBA_in_Europe/PBA_in_Europe_Class_II/

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Seed Central series of monthly events

The program for the next several months can be viewed at:
http://www.seedcentral.org/calendarofevents.htm

To learn more about Seed Central, please visit www.seedcentral.org

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C. OTHER MEETINGS, COURSES AND WORKSHOPS

7-11 January 2013. **Tucson Winter Institute in Plant Breeding**, University of Arizona, Tucson.

Monday - Wednesday (12:00pm) - January 7th - 9th, 2013:
Module 1: Introduction to Plant Quantitative Genetics (Walsh/Gore/Gutierrez)
Module 2: Introduction to Plant Genomics (Wing)

Wednesday (1:30pm) - Friday January 9th - 11th, 2013
Module 3: Advanced statistical plant breeding (Walsh/Gore/Gutierrez)
Module 4: Bioinformatics for breeders (Goff/Ragot)

Additional details, including a more detailed description of each module, can be found at www.PlantBreedingInstitute.bio5.org

Contributed by Bruce Walsh
University of Arizona

jbwalsh@email.arizona.edu

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January 28 to February 1, 2013, **International Plant Virus Epidemiology Symposium,** Arusha, Tanzania.

For further details, visit: www.iita.org/IPVE or contact Lava Kumar (L.kumar@cgiar.org).

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(NEW) *February 7-9, 2013*, **The biennial conference, Organicology**

This incredible event is hosted by Oregon Tilth, Organic Seed Alliance, Sustainable Food Trade Association and Organically Grown Company. We have joined forces to unite the organic trade in Portland, Oregon at the Hilton Portland and Executive Center. Register Now!

Organicology remains unique in its embrace of all aspects of the organic foods movement– this event is not just for the farmers or the retailers or the processors or the activists – but for all of those, as well as the eaters, the seeds people, the policy makers, the marketers, the educators, the materials suppliers and many others. Our curriculum consists of five, day-long intensives along with a wide variety of workshops on Friday, and an organic trade show on Saturday.

Our keynotes this year include: Paul Stamets, Curt Ellis, and Tom Philpott.

Register to Attend Register to Exhibit Sponsor More info

Education: Our unique conference is enhanced by numerous networking opportunities, high-quality entertainment and chef-prepared, organic meals—all included in your conference costs. Once again you'll have the opportunity to participate in Organic Trade "Speed Dating," as well as the Organic Exhibition Trade Show.

Inspiration: Back by popular demand will be the great Organicology Debates, which has become the stuff of legend. Step into a Thunderdome of lively characters, pitting their organic knowledge against each other for the ultimate showdown! Join us for an Organicology community Seed Swap, Winter Veggie Tasting, and a host of social receptions where you can relax and network with new and old friends over delicious, organic foods and spirits. Be sure to bring your dancing shoes, because The Pheromones and Karaoke from Hell are returning to shake up the night.

Ultimately, there are a myriad of educational and fun opportunities to explore at this unique event. Register now while room is available because classes do sell out. We hope you will join us for three days of serious learning, teaching and celebration!

Don't miss out on Organicology 2013 - Register Today to Attend or Exhibit

Thank you to our sponsors for your support of this event. View current sponsors or help support Organicology click here!

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(NEW) *March 1 - May 31, 2013*, **CIMMYT's Basic Wheat Improvement Course,** CIMMYT's Ciudad Obregon and El Batan research stations.

The Basic Wheat Improvement course is a unique and hands-on professional development opportunity for junior and early career scientists in the public, private, or non-governmental sectors. Scientists working in national agricultural research systems, particularly in the field of wheat improvement, will find this course especially useful. The course combines mentoring with the teaching of problem-solving approaches. Small groups of participants are assigned to individual CIMMYT scientists to work on a clearly defined research objective. The CIMMYT scientist will be the primary mentor for specific program and practical activities in the field. Classroom lectures and discussions will provide opportunities for further interactions between participants and various CIMMYT and visiting scientists, and promote an interdisciplinary approach. Because of this open learning approach, participants will be encouraged to share information on their national research programs.

Contact Amor Yahyaoui: ah.yahyaoui@cgiar.org For application form contact: CIMMY-TO@cgiar.org Or visit http://globalrust.org/

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(NEW) *June 9-13, 2013*, **The 7th International Triticeae Symposium (7ITS), Sichuan Agricultural University (SAU)**, Chengdu, China

The 7th ITS will cover four scientific research topics: Session I: Systematics and Phylogeny Session II: Biodiversity and Conservation Session III: Genetics and Genomics Session IV: Breeding and Utilization

Information can be found on the website: http://xms.sicau.edu.cn/7ITS/

Contributed by Helmut Knuepffer
knupffer@ipk-gatersleben.de

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2-5 June 2012. 2013. **Annual Meeting of the National Association of Plant Breeders.**Tampa, Florida

More information will be posted on the website soon: www.plantbreeding.org/napb/

Contributed by Barry Tillman
UF/IFAS
btillman@ufl.edu

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(NEW) *June 10-13 2013*, **Pre-breeding – fishing in the gene pool,** EUCARPIA Genetic Resources section meeting, Sweden, Alnarp (+ accommodations in Malmö)

The EUCARPIA PGR meeting will gather scientists, breeders and people from the genebank community from all around Europe and the world. Theme of the meeting is

Pre-Breeding - fishing the gene pool where we will discuss how we can better use our genetic resources to cope with problems that mankind is facing.

We will address in general the genomics of the genebanks, crop wild relatives, multifunctional agriculture and traits to address climate change. We will talk about the role of genebanks for food security, genetic diversity for health and nutrition, genetic endowments for reducing agriculture´s footprints and intellectual property management.

Contributed by Helmut Knuepffer
knupffer@ipk-gatersleben.de

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19–22 August 2013, **Next year's BGRI**, Taj Palace Hotel, New Delhi, India.

Technical Workshop to recognize the 50th anniversary of Norman Borlaug's work in South Asia. will be held at the BGRI South Asia program center in New Delhi

We are accepting proposals for a special plenary session that will highlight successful research partnerships between partners from less developed countries and developed countries.

If you are part of an effective international scientific partnership and have exciting results that you would like to present at the BGRI workshop, we want to hear from you.

To compete in the selection, please send your abstract of no more than 300 words and the name, institutions and addresses of the two speakers who represent two different institutions involved in the collaboration (at least one being from a less developed country). Also include a brief statement of 2-5 sentences explaining how the collaboration has been especially effective.

Send this information in a single file to Sarah Evanega by **December 1, 2012**. snd2@cornell.edu. You also may "nominate" scientists you know who are involved in qualifying partnerships. Three partnerships will be selected to present at the 2013 BGRI workshop. Preference will be given to partnerships that would be instructive to the BGRI community.

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14-17 October 2013, **11th African Crop Science Society Conference**, Yaoundé, Cameroon

For additional Information you can contact Dr. Leke Walter Nkeabeng, Vice-President ACSS Council, Chairman LOC Cameroon; P. O. Box 2123 Messa Yaounde, Cameroon; Tell: +237 79704342 (C),+237 94035711 (C), Email: lekwat@yahoo.com

Contributed by Kasem Zaki Ahmed¶Faculty of Agriculture
Minia University, El-Minia, Egypt
ahmed_kz@yahoo.com

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(NEW) **Texas A&M University to offer plant breeding doctorate degree through distance education**

College Station, Texas, USA
November 2, 2012

Students desiring a master's or doctorate degree from Texas A&M University in plant breeding will no longer have to make the move to College Station, according to university officials. "We know there is a worldwide shortage and demand for plant breeders at the Ph.D. level," said Dr. Wayne Smith, associate department head for the soil and crop sciences department within the College of Agriculture and Life Sciences.

As the global population increases, so does the demand for food, fiber and fuel, Smith said. Texas A&M, one of the top-tier U.S. universities training future plant breeders, has developed a plan to help meet the challenge and demand with a new distance education program in plant breeding. "There are many people with a bachelor's or master's degree working with major companies who could help fill those positions," he said. "This distance degree will give them the opportunity to remain employed wherever they are and still earn their next degree. Smith said the traditional plant breeding degrees within the college, whether in the soil and crop sciences or horticultural departments, require one semester of residency for a master's and two semesters of full-time enrollment with on-campus residency for a doctorate.

The distance degree waves that residency requirement. "While our entire faculty believes personal interaction with students is optimum, we understand there are clientele or potential students out there with a job and personal situations that are not allowing that to happen," he said. Texas A&M will begin offering distance education for a master of science in plant breeding, non-thesis option and thesis option, and a doctorate in plant breeding in the spring of 2013. "We will be the first research degree – master's or doctorate – offered at a distance in these fields in the U.S.," Smith said. "We are able to do this because it is an extension of the model we have with Texas A&M AgriLife Research and Texas A&M University.

"A person can be in Amarillo or the Philippines, and with the proper paperwork, they can now earn their degree," he said. Everything else in the degree program remains the same, it is just delivered via the Internet, Smith said. Students are enrolled in the same classes and taught by the same professors as students on campus. Their course content, homework and examinations also are the same. The student still must have a faculty advisory committee with a co-chair at their location who is a member of the graduate faculty at Texas A&M.

"We think there is an opportunity and a need, and we have the technology to meet it." Individuals interested in the graduate degrees in plant breeding distance program should contact Smith at cwsmith@tamu.edu or 979-845-3450; Dr. David Byrne, associate department head for horticultural sciences, dbyrne@tamu.edu or 979-862-3072; or LeAnn Hague, distance education coordinator in the soil and crop sciences department, leann.hague@tamu.edu or 979-845-6148. Learn more

http://www.seedquest.com/news.php?type=news&id_article=31036&id_region=&id_category=&id_crop=

Source: SeedQuest.com

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7. EDITOR'S NOTES

Plant Breeding News is an electronic forum for the exchange of information and ideas about applied plant breeding and related fields. It is a component of the *Global Partnership Initiative for Plant Breeding Capacity Building* (GIPB), and is published monthly throughout the year.

The newsletter is managed by the editor and an advisory group consisting of Chikelu Mba (chikelu.mba@fao.org), Elcio Guimaraes (e.guimaraes@cgiar.org), Margaret Smith (mes25@cornell.edu), and Ann Marie Thro (athro@reeusda.gov). Oriana Muriel is the Associate Editor (oriana.muriel@alumni.pitt.edu) The editor will advise subscribers one to two weeks ahead of each edition, in order to set deadlines for contributions.

Subscribers are encouraged to take an active part in making the newsletter a useful communications tool. Contributions may be in such areas as: technical communications on key plant breeding issues; announcements of meetings, courses and electronic conferences; book announcements and reviews; web sites of special relevance to plant breeding; announcements of funding opportunities; requests to other readers for information and collaboration; and feature articles or discussion issues brought by subscribers. Suggestions on format and content are always welcome by the editor, at pbn-l@mailserv.fao.org. We would especially like to see a broad participation from developing country programs and from those working on species outside the major food crops.

Messages with attached files are not distributed on PBN-L for two important reasons. The first is that computer viruses and worms can be distributed in this manner. The second reason is that attached files cause problems for some e-mail systems.

PLEASE NOTE: Every month many newsletters are returned because they are undeliverable, for any one of a number of reasons. We try to keep the mailing list up to date, and also to avoid deleting addresses that are only temporarily inaccessible. If you miss a newsletter, write to me at chh23@cornell.edu and I will re-send it.

REVIEW PAST NEWSLETTERS ON THE WEB: Past issues of the Plant Breeding Newsletter are now available on the web. The address is: http://www.fao.org/WAICENT/FAOINFO/AGRICULT/AGP/AGPC/doc/services/pbn.html *Please note that you may have to copy and paste this address to your web browser, since the link can be corrupted in some e-mail applications.* We will continue to improve the organization of archival issues of the newsletter. Readers who have suggestions about features they wish to see should contact the editor at chh23@cornell.edu.

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