For further information, contact:
Bee Wuethrich or Preeti Singh at +1-301-652-1558 ext. 201
bwuethrich@burnesscommunications.com
or Coimbra Sirica at +1-631-757-4027

**EMBARGOED FOR RELEASE UNTIL 13:15 HOURS CEST (Central European Summer Time)/ 11:15 HOURS GMT ON MONDAY 19 JUNE 2006**
*EDITOR'S NOTE: Report, schematic drawings and photographs available upon request.*

# Scientists to Employ Arctic Ice and Polar Bears To Protect Diversity of World's Crops

## *Global Effort to Conserve Threatened Crop Diversity Underscores Growing Threats to Food Security from Plant Diseases, Climate Change*

SVALBARD, NORWAY (19 June 2006)—On an island near the North Pole, heads of State from five Nordic countries and the Global Crop Diversity Trust laid the cornerstone today for a "fail-safe" seed vault to be carved into an Arctic mountain. The vault will ensure the long-term survival of the world's vital food crops. As polar bears prowled the island, the head of the Trust called the repository a major hedge against catastrophe—part of a broad global strategy to protect the world's food supply through conserving critical seed collections around the world, from the tropics to the highest latitudes.

"This facility will provide a practical means to reestablish crops obliterated by major disasters," said Cary Fowler, the Trust's Executive Secretary and lead author of the just-released Feasibility Study for the Arctic seed vault. "But crop diversity is imperiled not just by a cataclysmic event, such as a nuclear war, but also by natural disasters, accidents, mismanagement, and short-sighted budget cuts."

The Norwegian government and the Global Crop Diversity Trust spearheaded the effort to establish a seed repository of last-resort in the Arctic ice; carved into permafrost and rock, it will eventually house the seeds of every nation.

The Trust, an international, non-profit organization works to support the world's most critical crop collections, now scattered among some 1,400 gene banks on every continent (save Antarctica). While their status varies greatly, many are in dire straits, threatening the survival of some of the world's unique crop varieties. Yet agriculture worldwide relies on these collections of crop species and their wild relatives. They are vital to the development of new varieties, without which agriculture would grind to a halt.

Today's ceremony, featuring the Norwegian Prime Minister Jens Stoltenberg and Dr. Fowler, marked the initiation of the vault's construction with a stone-laying event. In a significant expression of support, the Prime Ministers of the other four Nordic nations—Finnish Prime Minister of Matti Vanhanen, Swedish Prime Minister Göran Persson, Danish Prime Minister Anders Fogh Rasmussen, and the Prime Minister of Iceland—convened for the event.

**Crops Coming into the Cold: Anatomy of the Seed Vault**

The "doomsday vault" or Svalbard International Seed Vault (SISV) will have a capacity of three million seed samples. It will ultimately house replicates of every known crop variety, as well as have ample capacity to accommodate new variation as it arises naturally. Enveloped by permafrost and rock, the samples will remain frozen even if electricity fails. Samples held in "black boxes" will only be released in the event that all other seed sources have been destroyed or exhausted.

The Feasibility Study for the doomsday vault thoroughly examined the pros and cons of such a facility in this remote Arctic site. The study concluded that under proper conditions, seeds for most major food crops could remain viable for hundreds of years, while others, including key grains, could survive for thousands of years.

A meter of reinforced concrete will fortify the chamber walls. Arctic permafrost will act as a natural coolant to protect the samples—which will be stored in watertight foil packages—should a power failure disable refrigeration systems. Despite changes being wrought by global warming, experts believe the deep permafrost will be reliably cool for at least the next 100 years. Even with a complete loss of refrigeration, vault temperatures would never rise above -3.5 Celsius or about 27 degrees Fahrenheit.

In addition to a strong security door and perimeter fence, the facility's remote location will enhance its security, as will the incredibly cold winters, ice flows, and the presence of Norwegian authorities. Facility planners also cite the ubiquitous presence of polar bears, not known for their hospitality toward humans, as a security measure.

The seeds placed in the facility will be replicates of those already available in existing gene banks. The vault will cost approximately US$3 million, which will be provided by the Norwegian government. The Trust is committed to supporting ongoing operational costs, and will be available to assist developing countries with preparing, packaging, and transporting their representative seeds to the Arctic.

**Conserving Diversity Crop by Crop**

In addition to supporting the Arctic seed vault, the Trust is developing conservation strategies for every major crop and every world region. These will include both seed crops and crops such as potatoes that can only be conserved with cuttings, and therefore cannot be banked in the Arctic vault. Just two years old, the Trust has begun funding critical yet imperiled collections of major food crops, including potato, wheat and apple. Investing relatively modest sums, the Trust is fending off serious threats to food security.

**Wheat**: The salvage effort comes at a critical time. A new kind of airborne wheat fungus or "rust" that can reduce yields by 55 percent emerged in Uganda in 1999, spread to Kenya and Ethiopia by 2003, and is now moving out of Africa and into South Asia. Dubbed Ug99, the rust was recently reported in coastal Pakistan and could threaten India's 21.6 million ton wheat harvest. Scientists need full access to wheat genetic diversity to develop immune varieties.

One critical collection of wheat is found in the gene banks of Russia's N.I. Vavilov Institute, where the Trust is funding the regeneration of threatened seed collections. These include wheats that originated in Central Asia and the Caucuses, on the fringes of the crop's center of domestication. Some of these rare wheat samples will be "repatriated" to gene banks in their countries of origin. The price tag for this vital program is US$70,000 a year for three years.

**Potato:** The same potato blight that in the 19th century caused more than a million deaths in Ireland has shown up in Alaska three times in the last ten years, and has also been seen recently in large areas of Bangladesh, where it was blamed for a 50 percent drop in yields.

Ireland's tragedy unfolded because its farmers cultivated only a handful of potato varieties. But crop gene banks in South America safeguard diverse collections of wild and cultivated samples could be vital to developing blight-resistant varieties. At least one of these gene banks came close to losing its entire potato collection following a break-down in its refrigeration system. The Trust has now funded the essential repairs, saving the potato collection, as well as collections of corn, barley, and wheat. The price tag: less than $25,000.

**Apple:** The most widely cultivated of all the fruit trees, the apple faces a growing variety of pests. The virus-like apple proliferation phytoplasma recently re-emerged in Germany, and is one of the most economically important threats to apple trees in central and southern Europe. In addition, many beloved apple varieties are susceptible to fire blight, which has become increasingly resistant to the two major antibiotic pesticides used to protect the trees. The disease reappeared in Italy in 2005 after six years of absence.

Yet the diverse genetic apple resources needed to cultivate resistant apple trees are rapidly disappearing, even in Central Asian where the apple was first cultivated. Kazakhstan's Talgar Pomological Gardens and Turkmenistan's Garrygalla Research Center hold irreplaceable collections of apple varieties, which include wild species—possibly the most ancient existing ancestors of the apples eaten today. Since the collapse of the Soviet Union, the two institutions had been struggling to survive, and outside plant breeders have had limited access to their genetic resources. Now, a Trust investment of $38,000 a year for the next three years will help secure the apple for future generations.

Climate change adds to the challenges facing the world's farmers—and to their reliance on crop genetic diversity. A recent report from the United Kingdom's Foresight Program identifies 10 major food crops grown in Sub-Saharan Africa that are likely to be affected by climate change in arid and semi-arid environments. Even now, plant breeders are trying to develop more drought-resistant varieties of several of these crops. Temperate-region crops are also at risk. For example, many plant rusts thrive under conditions of high moisture and rainfall. This includes a new form of soybean rust, which first reached the United States in 2004 from Latin America. Scientists now project that record-warm temperatures last winter contributed to the increased findings of Asian soybean rust in four states in the early part of 2006. The rust can rapidly destroy 80 percent of a crop.

"We need viable collections of crops like wheat, potato, and apple in areas where they originated and are still grown today," Fowler said. "The Arctic vault and other collections around the world will make sure that the resources will be there when and where they are needed. Without them, there will be a time when nothing will stand between humanity and mass starvation."

###

**The Global Crop Diversity Trust**

The mission of the Global Crop Diversity Trust is to ensure the conservation and availability of crop diversity for food security worldwide. Although crop diversity is fundamental to fighting hunger and to the very future of agriculture, funding is unreliable and diversity is being lost. An independent international organization, established through a partnership between the CGIAR and FAO, the Trust is the only organization working worldwide to solve this problem.