

## Food

## Crops yields reducing

## Experts develop 'super' potato resistant to heat

BANGOR, Maine, Nov 29, (AP): University of Maine researchers are trying to produce potatoes that can better withstand warming temperatures as the climate changes.

Warming temperatures and an extended growing season can lead to quality problems and disease, Gregory Porter, a professor of crop ecology and management, told the Bangor Daily News.

"The predictions for climate change are heavier rainfall events, and potatoes don't tolerate flooding or wet conditions for long without having other quality problems," Porter said. "If we want potatoes to be continued to be produced successfully in Maine, we need to be able to produce varieties that can be resistant to change."

Around the world, research aimed at mitigating crop damage is underway. A NASA study published this month suggests climate change may affect the production of corn and wheat, reducing yields of both, as soon as 2030.

Maine is coming off of a banner potato crop thanks in part to the success of the Caribou russet, which was developed by UMaine researchers. But Porter fears that even that variety isn't as heat tolerant as necessary to resist the future effects of climate change.



Porter

Pests are another factor. The Colorado potato beetle and disease-spreading aphids have flourished with the changing climate, said Jim Dill, pest management specialist at the University of Maine Cooperative Extension.

Breeding seemingly small changes like hairier leaves that make it difficult for insects to move around on the plant can cut down on pests' destruction and also the need for pesticides, he said.

Breeding such characteristics into potatoes is a long process of cross-pollinating different potato varieties.

The process is well underway. They're in a research testing phase right now at sites throughout the United States. Test potatoes in Virginia, North Carolina and Florida are testing high temperature stress.

"It takes 10 years of selection after that initial cross-pollination, and it might take two to five years before enough commercial evaluation has taken place to release a new potato variety," Porter said.

## Modified

Meanwhile, last month an Idaho company that successfully brought genetically modified potatoes to the market announced an agreement to help a California-based plant breeding company grow strawberries they say will stay fresh longer and have a longer growing season.

J.R. Simplot Company and Plant Sciences Inc., both privately-held companies, said they expect to launch the first commercially available, gene-edited strawberries within a few years.

U.S. growers produced \$2.2 billion in strawberries in 2020, mostly in California, according to the U.S. Department of Agriculture. But consumers discarded an estimated 35% of the crop due to spoilage. Simplot and Plant Sciences officials said genetically modified strawberries will help reduce waste, and make them available to consumers much of the year.

The strawberries will contain genes from only strawberries, selecting desirable traits that have been cultivated over decades.

"It's the same technology we're working on with potatoes," said Doug Cole, director of Marketing and Biotech Affairs at Simplot. "We have the opportunity to do that with this technology."

There is no evidence that genetically modified organisms, known as GMOs, are unsafe to eat, but changing the genetic code of foods presents an ethical issue for some. The US Environmental Protection Agency and US Food and Drug Administration approved a previous gene-modifying technique on Simplot potatoes. Now, more than 1.1 billion pounds (500,000 million kilograms) of the potatoes are sold in some 40 states and 4,000 supermarkets and 9,000 restaurants.

Cole said the company submitted information to the Agriculture Department that determined the gene editing being used on strawberries replicates a natural process and doesn't need regulatory approval before the strawberries are brought to the market. The company is also using that gene editing technique on potatoes.

Steve Nelson, president and chief executive officer of Plant Sciences Inc., said the company over the last 35 years has developed five distinct breeding populations of strawberries that do best in various growing areas and climate types.

"They possess complex genomes that contribute to long and complex breeding cycles," Nelson said. "You've got to look at large populations of seedlings on an annual basis to make progress with traditional plant breeding."

## Tolerance

Gene editing could speed that up. Nelson said the goal of the partnership with Simplot is to improve the horticultural performance of strawberries, enhance pest and disease tolerance and resistance.

He said for growers, who can spend \$35,000 an acre to plant strawberries and another \$35,000 per acre to harvest them, gene-edited strawberries could reduce the risk of a crop failure.

Simplot, a multinational agribusiness company with headquarters in Boise, Idaho, in 2018 acquired gene editing licensing rights in an agreement with Corteva Agriscience and the Broad Institute of the Massachusetts Institute of Technology and Harvard University, developers of a gene-editing technology called CRISPR-Cas9. Simplot was the first agricultural company to receive such a license.

The technology allows scientists to make precise changes to the genome of living organisms and has wide-ranging applications for improving plant food production and quality. It's been likened to using a search-and-replace function while editing a written document.

The gene editing technology is called CRISPR-Cas9, the first part an acronym for "clustered regularly interspaced short palindromic repeats."

The technology speeds up the traditional process of breeding generation after generation of plants to get a certain desirable trait, saving years in developing new varieties that are as safe as traditionally developed varieties, scientists say.

Craig Richael, director of research and development at Simplot, said the strawberry genetic code has been mapped, but it's not clear what traits are associated with all the various parts of the code. He said the company is working with parts of the code that are known, raising genetically modified strawberries at a Simplot greenhouse.

Plant Sciences Inc., headquartered in Watsonville, California, and its affiliates have proprietary rights for more than 50 strawberry and raspberry varieties. The company supplies plants to growers in more than 50 countries.

Simplot and Plant Sciences will make money by selling the genetically modified strawberry plants to growers, who pay a royalty for the rights to grow and sell the strawberries. Terms of the deal weren't released.



A woman is greeted by her relative as she arrives from Singapore at Larkin bus station in Johor Bahru, Malaysia, Monday, Nov. 29. Malaysia and Singapore partially reopened their borders Monday for fully vaccinated citizens and some others, after nearly two years of closure due to the pandemic that had stranded many Malaysians working in the neighboring city-state away from their families. (AP)

## Coronavirus

## Malaysians return to their homeland after 2 yrs

## Joyful reunions as land border reopens

JOHOR BAHRU, Malaysia, Nov 29, (AP): Malaysians working in Singapore held joyful reunions with their loved ones after returning to their homeland on Monday following the partial reopening of a land border that has been shuttered for nearly two years due to the pandemic.

Buses ferried fully vaccinated passengers across the Causeway Bridge that connects the island of Singapore with the Malaysian peninsula, with strict measures in place including pre-departure and on-arrival COVID-19 tests.

Malaysian Health Minister Khairy Jamaluddin tweeted that a COVID-19 case was detected during the screening in southern Johor state, but didn't elaborate. "As we safely reopen our borders, there will be positive cases at points of entry. Risk assessment, isolation and monitoring close contacts will become the norm," he said.

Under the first phase, only 1,440 travelers who must be citizens, permanent residents or long-term pass holders are allowed from each side per day. The Causeway was one of the world's busiest land borders before the pandemic struck. Air travel also reopened Monday with fewer restrictions, allowing anyone who is fully vaccinated to travel quarantine-free between the two countries.

"It's already since one year plus, I never meet her and when I see her today, I'm happy, I'm very happy," retiree Siva Ganesan said after greeting his wife, Uma Devi Balakrishnan, at the bus terminal in southern Johor state. His wife works as a cleaner in Singapore and was stranded when borders were shut.

A Malaysian man kissed and hugged his baby whom he met for the first time, while another woman sank tearfully into her father's arms. More than 100,000 Malaysians were believed stuck in the island-state after the border closed in March 2020.

"It's surreal, doesn't feel real at all because it's been a while not coming home," said Malaysian Cheong Weng Yin. "I have been feeling very nervous until I set foot here."

Across the border, Chua Pei Ze and her two daughters, age 10 and 7, were first in line for the first bus heading to Malaysia. "Finally we can get to bring my daughters to see their grandmother in person ... video calls just aren't enough," said the 43-year-old, who works in the shipping industry.

Kavin Raj, 24, said he will surprise his family because they weren't aware that he managed to get a ticket on the

## COVID vaccine hesitancy persists among 'health workers' in Africa

ABUJA, Nigeria, Nov 29, (AP): Africa is seeing a rise in deliveries of vaccine doses to the continent, but only one in four of its health workers has been fully vaccinated against COVID-19, the World Health Organization regional office has said recently.

The most common reasons for the low vaccination rate among health workers on the continent of about 1.3 billion people include vaccine hesitancy and the unavailability of vaccine services, especially in rural areas, Matshidiso Moeti, WHO's Africa director, told an online press briefing. It's a striking contrast to the more developed countries where more than 80% of health and care workers in 22 mostly high-income countries have been fully vaccinated, according to a recent WHO study.

The low vaccination rate among health workers in Africa "puts at risk not only their own health and well-being but also that of the patients that they look after," Moeti warned, calling on African countries to "urgently speed up the rollout of vaccines to those on the frontlines."

Africa has an acute shortage of health workers, with only one country in the region having the recommended number of health workers to provide essential health services.

"Any loss of these essential workers to COVID-19 due to illness or death therefore heavily impacts on service provision capacity," WHO's Nigeria office said in a statement.

Many of Africa's health workers, including those working in rural communities, still have "concerns over vaccine safety and adverse side effects," the WHO regional di-

rector Moeti said.

In Nigeria, Africa's most populous country, only 300,000 - or 18% - of its 1.6 million health workers have been fully vaccinated.

A recent study also found that only 40% of health workers intended to receive the vaccine while less than 50% hope to get their shot in Ethiopia, WHO said.

To increase the vaccination rate among health workers in Nigeria, nurses and midwives need to be more involved in the vaccination process, according to the president of the National Association of Nigeria Nurses and Midwives. With that and through health education, "many people will be convinced" to take the vaccine, Michael Nnachi said. "When the nurses are directly involved, we can achieve more."

Just about 7% of Africa's population has been fully vaccinated, mainly because of delays in vaccine supplies and vaccine hesitancy, Moeti said. But after challenging months in getting needed supplies, Africa is now seeing "an acceleration in the availability of vaccines."

As more doses are arriving on the continent, more countries are introducing mandates - often targeting government workers and public places - to increase the vaccination rate.

"It will be good to balance the approaches of persuasion, information sharing, expansion of capacity to deliver, intensification of the campaigns as well as using that additional tool of further motivating people to be vaccinated because they need to get services that they need," Moeti said.

first bus. "First thing, I would say, I will have a very good meal in Malaysia," he said excitedly.

More than 350,000 people crossed the Causeway daily before it was shut, mostly Malaysians working in Singapore due to a favorable exchange rate.

To mark the reopening of their border, Malaysian Prime Minister Ismail Sabri Yaakob drove across the Causeway for an official visit and was greeted by his Singapore counterpart Lee Hsien Loong at the checkpoint.

The two leaders said at a news conference that the limits on land border

crossings will be progressively relaxed next month to include general travelers and other modes of transportation than buses. A second land link is also expected to be restored soon.

"We are all watching anxiously to see what the omicron variant of the COVID-19 does and how it will behave," Lee said. "Even if the omicron disrupts these plans, our goal will still be to have more open borders ... and I am quite confident that after some time we will be able to make further progress."

Singapore has vaccinated 85% of its population, and Malaysia nearly 80%.



People wait to get their Coronavirus vaccine at the St. Nicholas Church in Leipzig, Germany, Sunday, Nov. 28, as vaccinations for COVID-19 are being offered in various Saxony region's churches. (AP)



Sánchez



Blanco

## Discovery

**Lava surges from volcano:** Several new volcanic vents have opened up on the Spanish island of La Palma, releasing new lava that is speeding down a ridge and threatening to widen the damages on evacuated land, roads and homes, authorities said Sunday.

The molten rock coming out from the main new vent was very fluid and was advancing at a speed of 6 meters (20 feet) per minute towards areas unspoiled until now, said Maria José Blanco, a spokeswoman for Spain's National Geographic Institute.

The eruption on the island, which lies on the western end of the Canary Islands archipelago in the Atlantic Ocean, began on Sept. 19.

In the 10 weeks since then, at least 11 different lava flows have been identified by scientists, covering at least 1,100 hectares (2,700 acres) of land, including thousands of homes, roads, power lines and irrigation pipes for the island's economically important banana plantations. Pedro Sánchez is the prime minister of Spain.

One of the rivers of lava last week destroyed a local cemetery, burying the remains of over 3,000 people.

Despite the damages, no injuries or deaths have been directly linked to the eruption.

Experts said at least 80 quakes were recorded overnight, with the most powerful reaching a magnitude of 3.6. Some of them could be felt by residents.

Despite the unabating volcanic activity on the island, flights returned to La Palma this weekend, following a week of cancellations by airlines due to the amount of volcanic ash blowing in the airport's direction. Tourism is a big industry for all of the Canary Islands, a favorite warm weather vacation site for Europeans. (AP)

**'Better yr for monarch butterflies':** Communal farmers and butterfly guides are hoping for a rebound in the number of monarch butterflies - and tourists - at their wintering grounds in central Mexico after a bad year for both last year.

Experts say it is too early to calculate the number of monarchs, which migrate from the US and Canada each year to forests west of Mexico's capital. A formal survey will be carried out in December.

But the butterflies have come to represent an important source of income for the farmers who own much of the pine and fir forest where the monarchs clump together

in trees. Already this year, some of the orange-and-black monarchs have settled into trees for the winter.

After a devastating drop in tourism because of the pandemic last year, and a 26% drop in the number of butterflies,



Potatoes await harvesting at Green Thumb Farms, Sept. 27, 2017, in Fryeburg, Maine. University of Maine researchers are trying to produce potatoes that can better withstand warming temperatures as the climate changes. (AP)

farmer and tourist guide Silvestre de Jesús Cruz, 49, is pinning his hopes on a better year for both this year.

"Last year was a little harder, because there were a lot fewer people. But this year is going to be good," De Jesús Cruz said. "A lot of the communal farm families depend on this," said the 21-year veteran of guide work, "not just us guides, but also the people down there in the parking lot selling food. A lot of people."

In the off-season - the butterflies arrive in November and leave around March - De Jesús Cruz plants corn and oats on his small farm parcel.

But those crops don't provide much cash. Cash income comes from tourism, and because of the coronavirus pandemic, only about 40,000 people visited the dozen or so butterfly wintering grounds on isolated mountain tops last year, down from 80,000 in previous years.

Already, some tourists are showing up this year.

Martha Echeverría, a resident of Mexico City who loves yoga, found the serenity of the El Rosario reserve to be a main draw. Visitors are encouraged to remain silent so as not to disturb the resting butterflies, and that makes for a scene so quiet you can hear the creaking of the fir bows and the sound of the wind. (AP)