RNR NEWSLETTER
A quarterly publication of the Ministry of Agriculture & Livestock
Vol. X Issue No. VI | www.moal.gov.bt | April- June 2023

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Introduction of Vibrant Varieties of Cauliflower and Cabbage for Health and Culinary Delight

NCOA, edited by Tashi Yangzom, PPD

The National Centre for Organic Agriculture (NCOA), situated in Yusipang, introduced two captivating varieties of colored cauliflower and a promising cabbage variety. The varieties were named "Valentena" and "Carotena," the purple and orange cauliflowers have shown remarkable success during evaluations at NCOA, while the "Red Jewel" cabbage also displayed its potential. These vibrant additions to Bhutan's agriculture landscape promises a health benefits and culinary appeal, aiming to captivate consumers' attention.

With an elevation of 2,650 meters above sea level, NCOA, Yusipang successfully yielded 6.8 MT/acre and 6.2 MT/acre of Valentena and Carotena cauliflower varieties, respectively. These hybrid seeds, imported from Syngenta in India, were sown in March and harvested in June.

The Variety Release Committee approved the release of the varieties on June 16, 2023. Consequently, these remarkable seeds will soon be available in the market for Bhutanese farmers to cultivate and produce these colorful vegetables.

Valentena, the purple cauliflower variety, boasts an abundance of anthocyanins, which are potent antioxidants. In addition to its vibrant appearance, Valentena offers potential benefits for heart health and inflammation reduction. On the other hand, Carotena, the orange cauliflower, is rich in beta carotene, a valuable nutrient for overall well-being.

Furthermore, the evaluation of the "Red Jewel" cabbage variety has yielded a bountiful first harvest. Like the coloured cauliflowers, this cabbage variety is also rich in anthocyanins. However, it goes beyond that, providing a plethora of essential nutrients such as Vitamin C, Vitamin K, Vitamin A, Folate, Vitamin B6, Vitamin E, Calcium, Magnesium, Potassium, Manganese, Phosphorus, Zinc, Riboflavin, and Thiamin. By incorporating the "Red Jewel" cabbage into diets, households can improve their nutrition, while also increasing crop and food diversity.

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Table 1. Growth and yield parameter of two coloured cauliflower varieties evaluated and released by NCOA

Variety	Avg head weight (kg)	Avg head size (cm)		Days to maturity after sowing	Yield/Acre (MT)
		Length	Width		
Valentena	0.250-0.400	12-15	12-16	90-100 days	6.8
Carotena	0.300-0.400	11-13	12-16	70-90 days	6.2

These versatile vegetables can be prepared in various ways, including adding them to soups, stews, and salads. Whether consumed raw, steamed, sautéed, or even fermented, they make delightful side dishes. The vibrant hues of the Valentena and Carotena cauliflowers, as well as the eye-catching allure of the "Red Jewel" cabbage, are expected to capture consumer attention due to their brightness, attractiveness, and visual appeal.

Figure 1. Photos of the cauliflower varieties

NCOA, Yusipang's introduction of these colorful varieties of cauliflower and cabbage serves as an innovative step toward promoting healthier eating habits, enhancing household nutrition, and supporting farming diversity in Bhutan. With their potential health benefits and culinary appeal, these vibrant vegetables are poised to make a positive impact on the local agricultural landscape and the well-being of Bhutanese consumers.

As these unique varieties become available in the market, farmers and consumers alike eagerly anticipate the opportunity to experience the vivid flavors, nutritional advantages, and visual splendor of these remarkable vegetables.

Figure 2. Red Jewel from NCOA field

Spring Maize - Potential for transforming Maize into a cash crop

ARDC Wengkhar

While the traditional practice of growing Maize in the spring season was there, especially in the lower foothills of Bhutan, this practice was upscaled in 2014 when the Department of Agriculture (DoA), Ministry of Agriculture and Livestock (MoAL) began a Spring Maize intensification program using some of the hybrid varieties. Thridangbi, Saleng, Khalangzi, and Chali are some sites in Mongar where maize is relayed with paddy, thereby putting land to effective use without leaving it fallow.

This adoption of Maize- Paddy cropping is mainly due to the potential of Maize encashed through the production and sale of Kharang and tengma apart from selling them fresh by roasting.

A kilogram (Kg) of Tengma fetches as high as Nu. 300 and Kharang between Nu. 60 to 100 in some seasons at par with rice driving farmers to intensify Maize production. Of late, selling roasted maize cob (Nu.100 for

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3 cobs) along the roadside has gained popularity among the growers.

Kelzang Pelden from Chali earned more than Ngultrum one hundred thousand within nine days of selling roasted maize and Tengma from her current harvest. Like Kezang, many of the people in these communities have similar stories to share.

Considering its opportunity to enhance income, spring Maize indeed has the potential to transform maize into a cash crop.

Over the years, local processing industries like Ama Kharang in Womrong - private investment, The 4 Bites Youth Group at Lingmethang under DAMC support, MoAL, and finally of late, interest in domestic Maize for feed through buyback and contractual farming approach initiated through Department of Livestock, (DoL), Department of Agricultural Marketing and Cooperatives (DAMC) and DoA can further create opportunities for expansion of Maize as a cash crop.

The national maize program at ARDC with the help of the International Centre for Maize and Wheat (CIMMYT) is currently strengthening our Hybrid Maize Program to ensure appropriate varieties are available. To this, our Hybrid variety (Wengkhar Hybrid Maize -1) was released in partnership with CIMMYT and CARLEP - IFAD / MoAL.

By stepping up some market linking programs, Contractual farming, and product diversification, Maize can bring about a change for many growers.

Leisure

Maize: Types of drying

Sun drying

It is a popular method of drying grains where spread grain is exposed to direct sunlight until the desired grain moisture content is achieved. It is low energy cost. The good practices that have to be followed in sun drying are as follows:

- Clean the drying surface properly before spreading the grain to prevent contamination with impurities.
- De-husked cobs should be spread on a ground cover such as a plastic sheet or any other suitable material to prevent seepage moisture from the ground reaching the cobs.
- Start the drying operation in the morning to get maximum sun shine hours of the day.
- Spread the cobs as thinly as possible on the drying floor, but not more than 5 cm thick, to achieve faster
- Grains absorb moisture during nighttime when the relative humidity of the air increases. In order to minimize this phenomenon, heap the cobs on the drying floor and cover the heaps with plastic sheet or any other protective material such as straw bags until the grains are spread on the following day. During sudden rains, heap the cobs or grains on the drying floor and cover the heaps with plastic sheet or any other moisture barrier.

Smoking

The insect infestation is reduced when hung above the fire as the heat reduces the moisture content and the chemicals in smoke deters insect from laying eggs.

Air Drying

The maize cobs are hung along the roof of the house to expose it to air and hence the moisture content is minimized.

JOKES

Sonam and his chicken farm

Sonam graduates from one of the agriculture institutes, goes into a farm supply store and orders two hundred chicks, explaining to the owner that he wants to start a chicken farm. Two weeks later, he returns to the store and buys another two hundred chicks.

The owner is curious, but doesn't say anything. The same thing happens when Sonam returns in another two weeks for another two hundred chicks. When he returns for the fourth time, the owner's curiosity is too much for him, so he asks Sonam why he keeps coming back for so many chicks.

Sonam says, "Well, I guess I must be doing something wrong, but I don't know what. I think I'm either planting them too deep or too close together."

Bemused by his lack of success, Sonam sends off a report of what he has done to Agriculture institute, asking for advice.

Three weeks later, the reply comes back, saying simply, "Please send soil sample."

Please submit your articles for the RNR-Newsletter at

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The Ministry's week

First ever Village Organic Fair

The first ever village organic fair was held at Chhudzom Gewog under Sarpang Dzongkhag from 27-28 May, 2023. The main objectives of the village fair were to bring together organic farmers of the gewog, showcase, and share experiences, and provide market avenue. It also aimed to encourage and advocate other organic operators under Chhudzom gewog.

Chhudzom is about three hours' drive from Gelephu and located at an altitude ranging from 1200 to 1800 masl with a pristine and clean ecosystem providing opportunities for organic production. Chhudzom is also a main hub for supplying fresh and nutritious vegetable to the urban residence of Gelephu and nearby towns. The Gewog administration has declared itself to maintain and pursue organic farming considering its health and environmental benefit.

Two new species of orchids described from Bhutan

Two new species of Bulbophyllum orchids have been discovered by a team of researchers from the College of Natural Resources, National Biodiversity Centre (NBC), Department of Forest and Park Services, and Department of Plant and Soil Science in the United States. Bulbophyllum gurungianum and Bulbophyllum punakhaense are the names of the two new orchid species.

Currently, Bhutan is home to 65 species of Bulbophyllum orchids. The journal article is published in the journal Lankesteriana in 2023, describing the new species.

Bulbophyllum gurungianum is named in honor of Professor Dhan Bdr. Gurung, College of Natural Resources, Lobesa, and Punakha Dzongkhag who first discovered the orchid in 2006 and for his immense contribution to orchid taxonomy in Bhutan

Bhutan takes steps toward establishing Geographical Indications (GI) system for premium products

The Ministry of Agriculture and Livestock (MoAL) in collaboration with the Ministry of Industries, Commerce, and Employment (MoICE) spearheaded efforts to establish a Geographical Indications (GI) system in the country, aiming to protect and promote origin-linked and premium products both nationally and internationally. As a part of this initiative, the MoAL with funding support from Food and Agriculture Organization organized a "National Sensitization and Consultation on GI System" for the key stakeholders, including policy decision makers, executives, and managers of relevant government agencies and private sector on June 20, 2023, in Thimphu.

Published by:

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