



Agriculture Farming

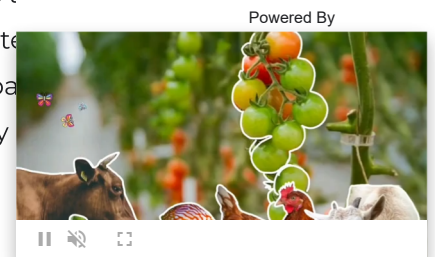
Climate-Resilient Crop Varieties: Why You Should Consider Climate-Smart Agriculture

Climate change possess a growing threat to our global food security. To combat its effects, we must embrace climate-smart agriculture, and a crucial aspect of this approach is adopting climate-resilient crop varieties. These crops are uniquely adapted to withstand the challenges of a changing climate. In this blog, we'll delve into why you should consider these remarkable crops and how they help ensure a more sustainable and secure food supply for the future.

Climate-Resilient Crop Varieties

What Is Climate-Resilient Crop Varieties?

Climate-resilient crop varieties are specially bred-plants that possess a remarkable ability to thrive in the face of climate change. These crops have been meticulously developed through traditional breeding methods, selecting traits that enable them to stand extreme weather conditions, such as droughts, floods, and temperature fluctuations. They're like nature's superheroes, equipped to combat the challenges a changing climate throws them. These resilient crops offer a safety net for food supply, even in the harshest conditions.



Climate-Resilient Crop Varieties: A Lifeline for Agriculture

In the relentless battle against climate change and malnutrition, the Indian Council of Agricultural Research has crafted 35 remarkable crop varieties. These plants are not your ordinary crops; they are superheroes of the agricultural world, equipped to combat the effects of a changing climate. These climate-resilient varieties are designed to thrive in harsh conditions, making them essential in ensuring food security and good nutrition.

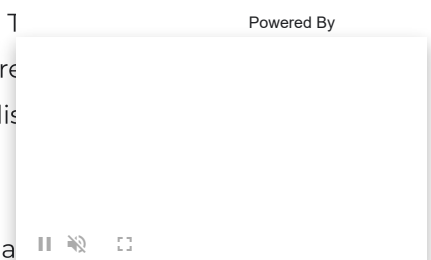
Varieties That Stand Strong: These specially developed crops include drought-tolerant chickpeas, early-maturing soybeans, disease-resistant strains of rice, pigeon pea resistant to wilt and sterility mosaic, and biofortified versions of wheat, pearl millet, maize, and chickpea. The lineup even features unconventional gems like quinoa, buckwheat, winged bean, and faba bean.



Climate Change's Impact on Agriculture: The recent report of the Intergovernmental Panel on Climate Change states the far-reaching consequences of climate change, including shifting monsoons, rising sea levels, deadly heatwaves, storms, and floods. These changes pose a severe risk to agriculture, making the need for climate-resilient crops even more critical.

The Quest for Resilient Crops: In response to these challenges, the National Innovations in Climate Resilient Agriculture was launched in 2011. Through field trials and technology demonstrations, the ICAR-led project aims to increase crop resilience by concentrating not only on crop yield but also on tolerance to diseases, drought, salinity, and flooding.

Addressing Anti-Nutritional Factors: Additionally, these particular varieties aim to tackle anti-nutritional factors, substances that can harm human and animal health. Some examples are plants that do not have a lot of erucic acid and glucosinolates and soybean varieties that do not have any Kunitz trypsin inhibitor or lipoxygenase.



Climate-Resilient Rice Varieties for India's Farmers

Climate-resilient rice varieties can withstand drought, flood, saltwater intrusion, and extreme weather events. They are either created by scientists or preserved by farmers using local landraces. These varieties have higher nutrition profiles and yield potential than conventional rice. Some examples of climate-resilient rice varieties for India's farmers are Sahbhagi dhan, Swarna Shreya, Bina dhan 11, and Swarna sub 1. These varieties can help improve food security and income in the face of climate change.



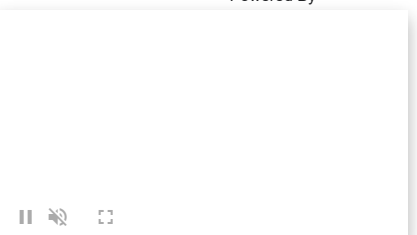
Heat-Tolerant Rice Varieties for India's Hot Climate

Heat-tolerant rice varieties are essential for India's hot climate, where high temperatures can reduce the yield and quality of rice crops. Some rice varieties developed or identified as heat-tolerant are Nagina22, KMR3, and Buro. These varieties can withstand temperatures above 35°C and have a lower heat susceptibility index (HSI) than popular varieties like BPT5204 and Vandana. Heat-tolerant rice varieties can help farmers cope with climate change and ensure food security in India.

Drought-Tolerant Rice Varieties for Water-Scarce India

Drought-tolerant rice varieties, such as Sahbhagi Dhan, DRR Dhan 44, improve food security and livelihoods in rainfed varieties, bred using marker-assisted selection, have an average yield of 1.5 tons per hectare over drought-susceptible ones. These varieties are crucial for improving food security and livelihoods in rainfed areas.

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Saline-Tolerant Rice Varieties for Coastal Regions

Saline-tolerant rice varieties thrive in high salt content soils, a challenge rice cultivation faces in coastal Asia due to increased salt levels from seawater intrusion, storm surges, and droughts. Scientists have developed saline-tolerant rice varieties, such as Salinas 1, Salinas 9, Goa Dhan-1, Goa Dhan-2, Goa Dhan-3, and Goa Dhan-4, which can withstand up to 0.3% salt levels and can withstand submergence and other stresses.



Climate-Resilient, Heat-Tolerant, and Drought-Tolerant Wheat Varieties for India's Farmers

Wheat is one of the most important staple crops in India, but it is also sensitive to high temperatures and water stress. To address this challenge, scientists have developed heat-tolerant and drought-tolerant wheat varieties that can perform well in India's hot and dry regions.

In case you missed it: [Climate-Smart Agricultural Methods for More Yields and High Profits](#)



For example, HD 3226 is a heat-tolerant wheat variety that can yield up to 5.6 tonnes per hectare under high temperatures. Similarly, DBW 187 is a drought-tolerant wheat variety that can produce up to 6.5 tonnes per hectare under water-limited conditions. These varieties can help farmers increase their productivity and income in the face of climate change.

Saline-Tolerant Wheat Varieties for Coastal Regions

Another challenge for wheat cultivation in India is soil salinity, especially in the coastal regions. Salinity reduces the growth and yield of wheat plants by affecting their water uptake and nutrient absorption. To overcome this problem, scientists have developed saline-tolerant wheat varieties that can tolerate high salt levels in the soil. For instance, KRL 283 is a saline-tolerant wheat variety that can yield up to 4.8 tonnes per hectare in saline soils.

Climate-Resilient, Heat-Tolerant, Drought-Tolerant Maize Varieties for India's Farmers

Maize is another important crop in India, especially for animal feed and food processing industries. However, maize is also vulnerable to heat and drought stress, which can reduce its yield and quality. To cope with this issue, scientists have developed heat-tolerant and drought-tolerant maize varieties that can adapt to India's hot and dry climate.

In case you missed it: [How to Unlock Key Technologies to Improve Food Security: Reduce Pesticide Use and Enhance Crop Climate-Resilience](#)



For example, HQPM 7 is a heat-tolerant maize variety that can yield up to 7 tonnes per hectare under high-temperature conditions. Likewise, PMH 14 is a drought-tolerant

maize variety that can produce up to 6 tonnes per hectare under water-scarce conditions. These varieties can help farmers enhance their maize production and profitability in the face of climate change.



Saline-Tolerant Maize Varieties for Coastal Regions

Maize also faces the problem of soil salinity in some parts of India. Salinity affects the germination and growth of maize plants mainly by causing osmotic stress and ion toxicity. To solve this problem, scientists have developed saline-tolerant maize varieties that can grow well in saline soils. For example, Pusa Hybrid Makka 3 is a saline-tolerant maize variety that can yield up to 5 tonnes per hectare in salty soils.

Climate-Resilient, Heat-Tolerant, and Drought-Tolerant Soybean Varieties for India's Farmers

Soybean is a major oilseed crop in India, but it is also susceptible to heat and drought stress. Heat stress affects the flowering and pod setting of soybean plants, while drought stress affects the seed filling and oil content. To address this challenge, scientists have developed heat-tolerant and drought-tolerant soybean varieties that can thrive in India's hot and dry climate.

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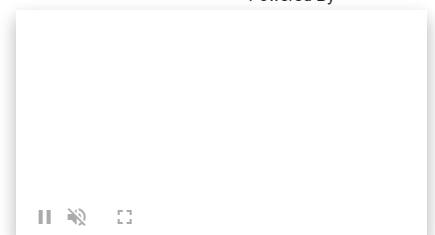
For example, JS 335 is a heat-tolerant soybean variety that can yield up to 2.5 tonnes per hectare under high-temperature conditions. Similarly, MACS 1242 is a drought-tolerant soybean variety that can produce up to 2 tonnes per hectare under water-limited conditions. These varieties can help farmers improve their soybean production and quality in the face of climate change.

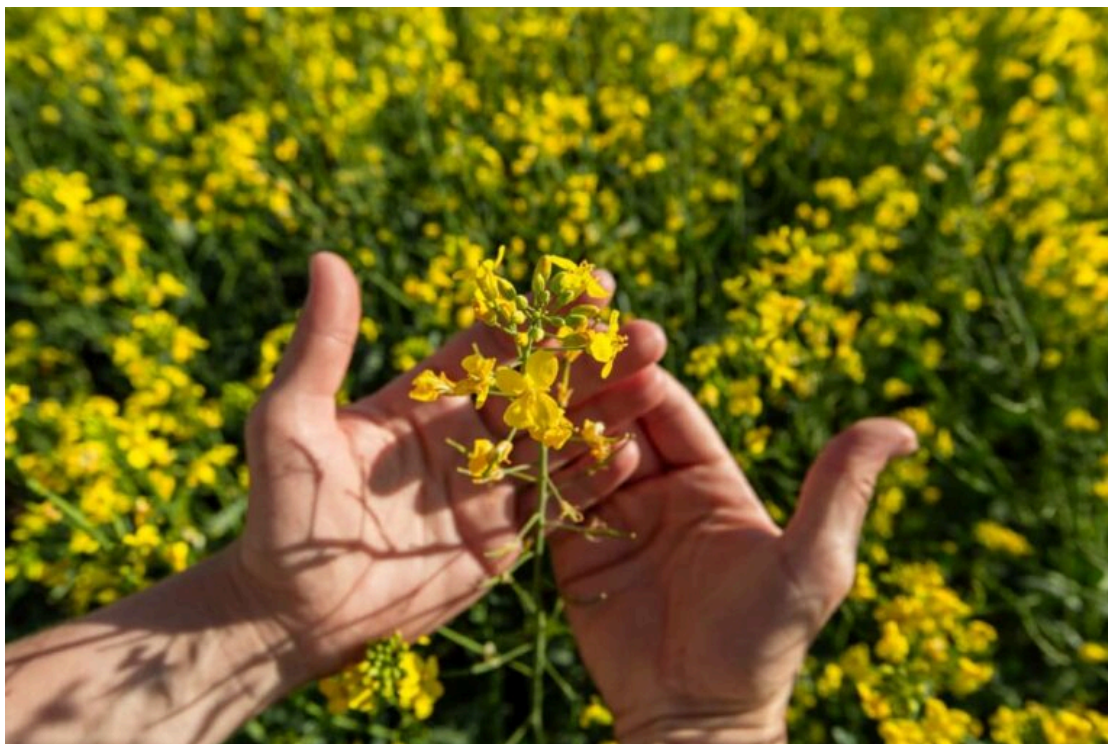
Climate-Resilient Oilseed Varieties for India's Farmers

Oilseeds are another critical group of crops in India, providing edible oils and animal feed. However, oilseeds are also prone to heat and drought stress, affecting their yield and oil content. To cope with this issue, scientists have developed climate-resilient oilseed varieties that can withstand the adverse effects of climate change.

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For example, NRCHB 506 is a climate-resilient mustard variety that can yield up to 2 tonnes per hectare under varying climatic conditions. Likewise, NRCG-06-02 is a climate-resilient groundnut variety that can produce up to 3 tonnes per hectare under different climatic conditions. These varieties can help farmers increase their oilseed production and income in the face of climate change.



Climate-Resilient Pulses Varieties for India's Farmers

Pulses are another critical group of crops in India, providing protein and nitrogen fixation for the soil. However, pulses are also sensitive to heat and drought, which can affect their yield and quality. To overcome this problem, researchers have developed climate-resilient pulse varieties that adapt to India's hot and dry conditions.

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For example, Pusa 16 is a climate-resilient chickpea variety that can yield up to 2 tonnes per hectare under varying climatic conditions. Similarly, Pusa 992 is a climate-resilient pigeon pea variety that can produce up to 1.5 tonnes per hectare under different climatic conditions.

Pest and Disease-Resistant Crop Varieties for Indian Agriculture

Pest and disease-resistant crop varieties in Indian agriculture as they offer a multi-faceted solution to challenges. These resilient crops reduce crop losses, minimizing the need for pesticide applications and lowering the environmental footprint of farming practices.

Chickpea: The drought-tolerant chickpea variety stands strong against water stress, a common issue in India's diverse climatic regions. This resilience not only ensures better yields but also reduces water consumption, making it a sustainable choice for farmers.

Pigeonpea: Pigeonpea has been fortified with resistance against wilt and sterility mosaic diseases caused by fungi and viruses. By withstanding these challenges, the variety significantly enhances productivity and lowers the risk of crop failure.

Soybean: Early maturing soybean varieties are a game-changer. Their rapid development swiftly allows them to escape the clutches of drought and pests. Their adaptability to multiple cropping systems makes them versatile and valuable in Indian agriculture.

Rice: Disease-resistant rice varieties combat bacterial blight, blast, and brown plant hopper. These traits ensure a more secure rice harvest, a staple food for millions in

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India.

Wheat, Pearl Millet, Maize, and Chickpea: These biofortified varieties are champions in improving human nutrition. With elevated levels of iron, zinc, and protein, they address malnutrition and related health concerns, offering a win-win solution for farmers and consumers.

Climate-Resilient Crop Varieties in India

Crop	Variety	Special Features
Buckwheat	Him Phaphra	High protein (13.1%) with methi
Chickpea	Pusa Chickpea 4005	Drought Tolerant
Chickpea	IPCMB 19-3 (Samriddhi)	Fusarium wilt resistant high pr
Faba bean	HFB 2	High seed yield and protein co
Maize	Pusa HQPM-1 Improved (APQH-1)	High provitamin, lysine (4.59%)
Maize	Pusa Biofortified Maize Hybrid-1 (APH-1)	Rich in provitamin-A (6.6 µg/g),
Mustard	Pusa Duble Zero Mustard 33	High yielding (26.4 q/ha) with C
Mustard	RCH 1	High yielding (26.7 q/ha) hybri
Pearl millet	PB 1877	Rich in Iron (42 ppm) and zinc
Pearl millet	HHB 67 Improved 2	Rich in Iron (42 ppm) and zinc
Pigeonpea	IPH 15-3	Early maturing and resistant tc
Pigeonpea	IPH 09-5	Early maturing and resistant tc
Quinoa	Him Shakti	High protein content (15.64%) a
Rice	DRR Dhan 58	Resistant to bacterial blight an
Rice	DRR Dhan 59	Resistant to bacterial blight
Rice	DRR Dhan 60	Resistant to bacterial blight an
Rice	Pusa Basmati 1847	Bacterial blight and blast resist
Rice	Pusa Basmati 1885	Bacterial blight and blast resist
Rice	Pusa Basmati 1886	Bacterial blight and blast resist
Rice	Pusa Basmati 1979	Herbicide tolerance
Rice	Pusa Basmati 1985	Herbicide tolerance
Sorghum	CSH 47 (SPG 1798)	High biom
Sorghum	Jaicar Raseela-CSV 49SS (SPV 2600)	Sweet sor
Sorghum	JaicarUrja-CSV 48 (SPV 2402)	High biom
Soybean	KBVS 1 (Karune)	Green pod
Soybean	NRC 138	Early mat
Soybean	NRC 142	Double null variety free from ar

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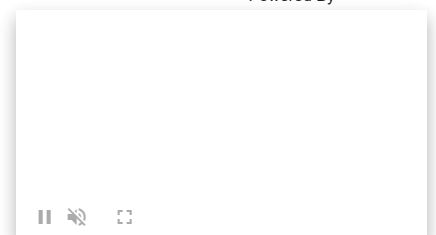


Conclusion

In the face of climate change, embracing climate-resilient crop varieties is not just an option; it's a necessity. These crops offer a lifeline to our food security, reducing the impact of extreme weather events and ensuring sustainable yields. By choosing climate-smart agriculture, we invest in a more secure and resilient future for agriculture, safeguarding our food supply and the well-being of generations to come.



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