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China launches CottonMind 1.0 - Dedicated AI platform for cotton research and farmers

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China has launched CottonMind 1.0, described as the worldâ??s first large language model dedicated to cotton, bringing research literature, breeding information, field diagnostics and farm advisory services onto a single platform

The Institute of Cotton Research of the Chinese Academy of Agricultural Sciences, working with the academy's Western Agricultural Research Center, has released CottonMind 1.0, a specialised digital platform built for the cotton sector. The launch marks an effort to connect cotton research, breeding, field management and farmer advisory services through one knowledge system. The platform is designed to help researchers find and interpret scientific information faster while giving growers access to crop advice and expert support through their phones.

CottonMind 1.0 was developed by a team led by Yang Zuoren, a researcher at the Institute of Cotton Research, CAAS. The platform has two interfaces: a web-based research platform for scientists and a mini-programme designed for cotton growers. For researchers, the web version acts as a searchable cotton knowledge library. It offers scientific search, faster reading of research papers and visual tools that connect information on genes, traits, crop varieties, cultivation practices and plant-health issues.

For growers, the mini-programme is intended to function as a portable farm advisory service. Users can ask crop-management questions, upload photographs for preliminary diagnosis and seek online consultation from specialists. The goal is to reduce the distance between agricultural expertise and the field, particularly in regions where farmers may not have immediate access to extension workers.

The platform draws on a large cotton-specific information base: 41,680 Chinese and international research papers, more than 2,000 patents and national standards, 559 specialised books and 1,806 approved cotton-variety records. The knowledge base covers gene function, trait development, variety breeding, cultivation management and pest and disease control. That breadth

matters because cotton production is shaped by decisions that often cannot be treated in isolation. A farmer dealing with low yield may need to consider seed choice, irrigation, nutrient management, pest pressure, weather and planting density. A breeder working on a fibre-quality trait may need to assess genetic information alongside field performance and breeding records.

CottonMind 1.0 is meant to make those connections easier to access. Rather than relying on a general online search, users can draw from a cotton-focused information base built around the sector's own research and production needs. The system uses a retrieval-based approach that brings relevant documents and technical records into the response process, rather than relying only on a general model's stored information. It also uses multiple specialised digital agents to address different types of questions.

The practical aim is to reduce a familiar problem with general-purpose AI tools: they can produce fluent answers even when the underlying information is incomplete, outdated or incorrect. A crop-specific platform can narrow the field of reference, draw on recognised agricultural sources and make it easier for users to trace answers back to technical material. Still, CottonMind 1.0 should be seen as an aid to decision-making rather than a replacement for field inspection, laboratory testing or professional agronomic judgement. Farmers will still need local advice where a diagnosis carries financial or crop-health consequences.

The platform supports Chinese, English, Uyghur and Uzbek across its interfaces. This multilingual design is particularly relevant for cotton-growing areas such as Xinjiang, where language can affect farmers' access to technical guidance. The inclusion of Uyghur and Uzbek could also help build links between Chinese cotton researchers and cotton-producing regions across Central Asia. Cotton is a major agricultural and industrial crop in several countries in the region, and common digital tools may make it easier to exchange research, cultivation practices and varietal knowledge.

For government departments, the platform could provide another function: bringing together industry data that may support planting plans, disease-control strategies and sectoral policies. If the data are regularly updated and handled carefully, such a system could help authorities identify emerging pest risks, compare varietal performance and understand changes in production conditions. The next challenge is adoption. A digital platform can contain extensive data, but its real value depends on whether researchers use it in their work and whether farmers find it reliable, easy to access and useful during time-sensitive field decisions.

For researchers, CottonMind 1.0 will need to demonstrate that it saves time without oversimplifying scientific evidence. For farmers, it will need to provide practical and locally relevant answers in a form that can be understood and acted upon. For agricultural extension agencies, it will need to complement—not duplicate or displace—existing farmer-support systems.

The developers say they will continue refining the model, expanding its applications and improving its deeper analytical capabilities for researchers and precision services for producers. The launch comes as China's cotton sector increasingly turns to digital crop management, biological breeding and data-led farm services. Earlier initiatives have included cotton digital-management systems that combine farm data, crop models and agronomic standards to support cultivation

CottonMind 1.0 takes that work a step further by attempting to bring the knowledge side of cotton production into the same system: research literature, patents, standards, variety records and production advice. Its promise lies in making specialised knowledge easier to use. A cotton researcher should not have to search through thousands of papers to find a relevant disease-management study. A grower should not have to wait days to obtain basic guidance on a visible crop problem. A policymaker should not have to rely only on fragmented reports to assess changing production conditions.

Whether CottonMind 1.0 can meet those expectations will depend on the quality of its answers, the frequency with which its knowledge base is updated, the transparency of its sources and its ability to work in the practical conditions of cotton farms. For now, the launch is a notable milestone for China's cotton industry. It represents an attempt to turn decades of cotton research and field experience into a tool that can serve both laboratories and farms—and to make the path from scientific discovery to crop management a little shorter.