



Beijing's Smart Crop Protection System

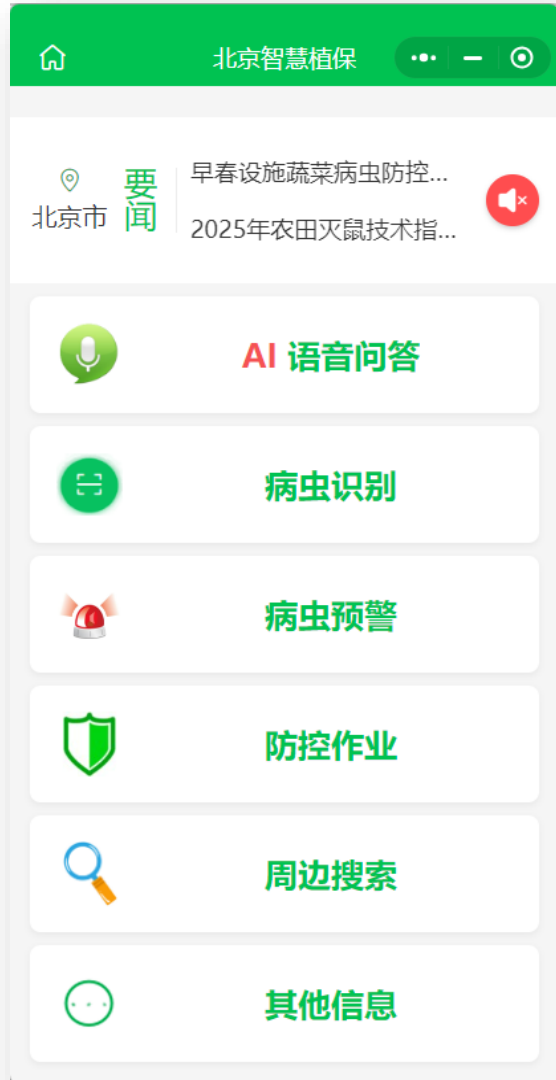
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What Services can the System Provide?



Six Core Service Modules

- ➔ **AI** Intelligent Voice Q&A
- ➔ Intelligent Identification of Pests
- ➔ Intelligent Early Warning of Pests
- ➔ Intelligent Control of Pests
- ➔ Peripheral Service Searching
- ➔ Practical Information Query

**AI Super Crop
Protection Expert**

1. AI Intelligent Voice Q&A



The system is driven by the Shennong Plant Protection Multimodal Model 1.0

- 10 million entries of agricultural knowledge graph data
- 50 million entries of modern agricultural production data
- 20,000 volumes of agricultural books
- 400,000 high-quality annotated plant protection image data
- 50,000 entries of pests prevention and control technical information
- 30,000 pieces of high-quality plant protection Q&A data
- Beyond crop protection, the system also provides solutions for cultivation techniques and fertilization practices
- Response rate in excess of 99%
- Expert accurate responses
- Accessibility for visually impaired and low-literacy users

2. Intelligent Identification of Pests

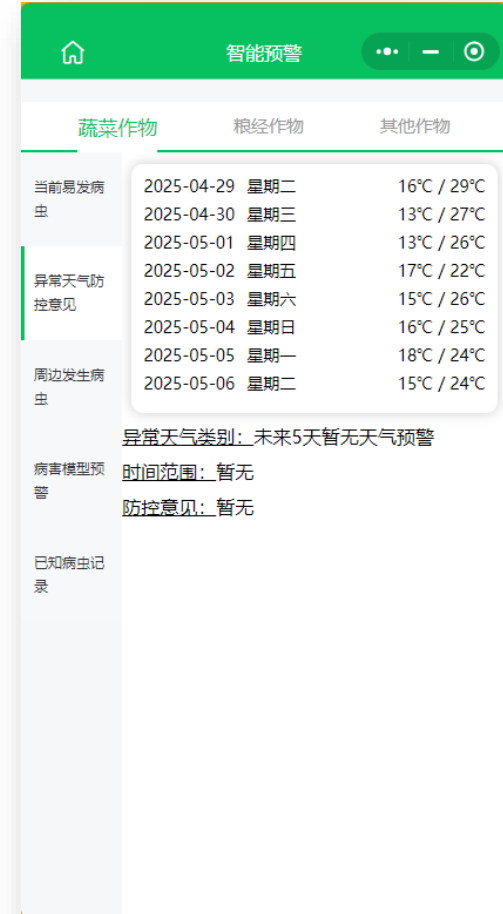


- Instant identification of 347 crop pests and diseases
- including 230 vegetable-specific threats
- through mobile phone camera scanning
- Accurate pest and disease identifications
- automatically link to professional recommendations control

Intelligent Early Warning



- Automated alerts for high - risk crop pests and diseases monthly
- Targeted prevention and control guidance in the face of erratic weather
- The intelligent pest and disease model issues real - time early warnings



Improvement

- Expanding the system's crop pest and disease image database is of utmost urgency
- Expand early warning models to enhance pest and disease prediction coverage
- Developing an English-enabled Smart Crop Protection System for the global implementation



$$LWD_{\min} > 5 \text{ hour} \& T_{LWD} > 10^{\circ}\text{C} \quad (1)$$

$$LP = \begin{cases} \left(\frac{T_{\max} - T_h}{T_{\max} - T_{opt}} \right) \left(\frac{T_h - T_{\min}}{T_{opt} - T_{\min}} \right)^{\frac{(T_{opt} - T_{\min})}{T_{\max} - T_{opt}}} & \text{if } LWD = 1 \\ 0 & \text{else} \end{cases} \quad (2)$$

$$PI = \sum_{i=1}^n LP \quad (3)$$

$$PI > PI_{\min} \quad (4)$$

$$SP = \begin{cases} \left(\frac{T_{\max_sp} - T_h}{T_{\max_sp} - T_{opt_sp}} \right) \left(\frac{T_h - T_{\min_sp}}{T_{opt_sp} - T_{\min_sp}} \right)^{\frac{(T_{opt_sp} - T_{\min_sp})}{T_{\max_sp} - T_{opt_sp}}} & \text{if } T > 15 \\ \left(\frac{T_{\max_sp} - T_h}{T_{\max_sp} - T_{opt_sp}} \right) \left(\frac{T_h - T_{\min_sp}}{T_{opt_sp} - T_{\min_sp}} \right)^{\frac{(T_{opt_sp} - T_{\min_sp})}{T_{\max_sp} - T_{opt_sp}}} * 0.02 & \text{else} \end{cases} \quad (5)$$

$$SI = \sum_{i=1}^n SP \quad (6)$$

$$Inc = a * SI^2 + b * SI + c \quad (7)$$

Thank you!

