Asia-Pacific
Economic Cooperation

Building a low-cost and accessible data infrastructure for small stakeholders

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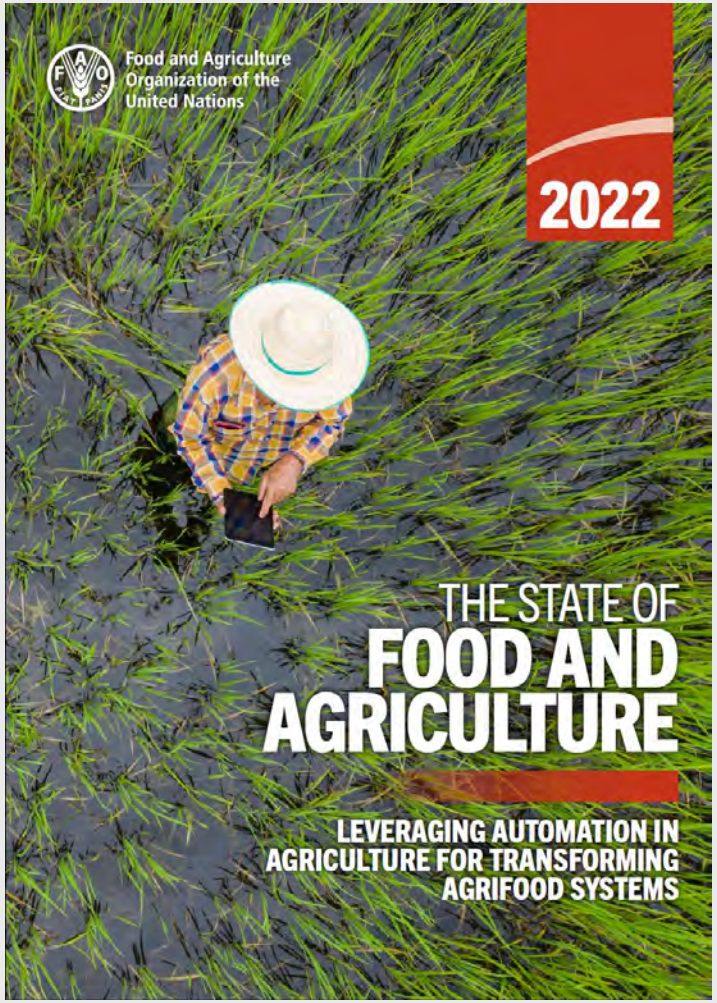
China Agriculture Machinery Distribution Association

Workshop on Addressing Food Security Challenges by Promoting Data Driven Policymaking

Core messages from FAO's report in 2022



2 Agricultural automation can deepen inequalities if it remains inaccessible to small-scale producers and other marginalized groups such as youth and women; certain technologies – large motorized machinery – can also have negative environmental

3 Before the digital revolution, motorized mechanization (e.g. tractors) was key to agricultural transformation worldwide; however, there have been wide disparities in adoption between and within countries, with adoption being particularly limited in

4 If tailored to local needs and supported by digital tools, motorized mechanization still has the potential to improve agricultural productivity, leading to poverty

5 The use of digital automation technologies is growing, but mostly in high-income countries. Often their business case is not yet mature: some technologies are still in the prototype stages, while for others a limited enabling rural infrastructure – such as connectivity and electricity – hinders their dissemination, especially in low- and

7 Digital automation technologies have great potential to achieve higher efficiency, productivity, sustainability and resilience. Yet, inclusive investments are needed – involving producers, manufacturers and service providers, with special attention to

China's Development Plan for Digital Agriculture and Rural Areas (2019-2025)

This is a cross-sectoral policy document by PRC government to accelerate development of precision agriculture and rural production and administration, smart management services, and rural government digitization.

Current situation

The good

- 98% of villages have high-speed internet connection.
- 246.1 mobile phones per 100 households.
- UAV, IoT, Beidou navigation system, and cloud computing are used in many demonstration projects.
- E-Commerce has taken off even in remote areas.
- Ag-machines have been widely used in staple crops.

The bad

- 40% farmers are older than 60.
- Younger generations are less willing to farm.
- The typical size of family farms is about 10 ha.
- The cost of data collecting on small farms is very high and difficult.
- Collected data are often not used by farmers due to the lack of commercial software.
- The support from commercial companies is weak due to the lack of incentive.

Efforts made by China Agricultural Machinery Distribution Association

CAMDA

An economy-level organization for ag-machinery industry with 1,000+ members.
Organizes China International Ag-Machinery Exhibition, the largest in Asia, every year in Oct.

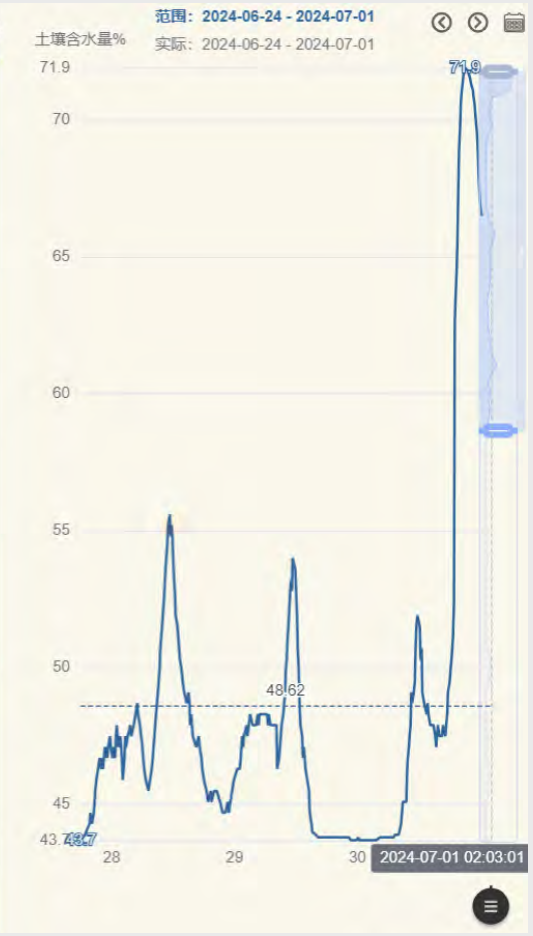
Digital agriculture (DA) has become a priority area for the association. In 2023, formed the United Board of Digital Agriculture together with China Crop Protection Industry Association, China Phosphate & Compound Fertilizer Industry Association, China National Seed Trade Association, and 20+ universities.

A new strategy for digital agriculture development for small farms

Different from many previous demonstration projects that only covered large farms, an integrated framework to serve small stakeholders was designed for the whole region at a county level. We call it “A Pilot Area of Smart Agriculture”.

A new data infrastructure to support this strategy

Data services must be of low-cost, sometimes free, and easy to access via smart phones, IoT is essential.

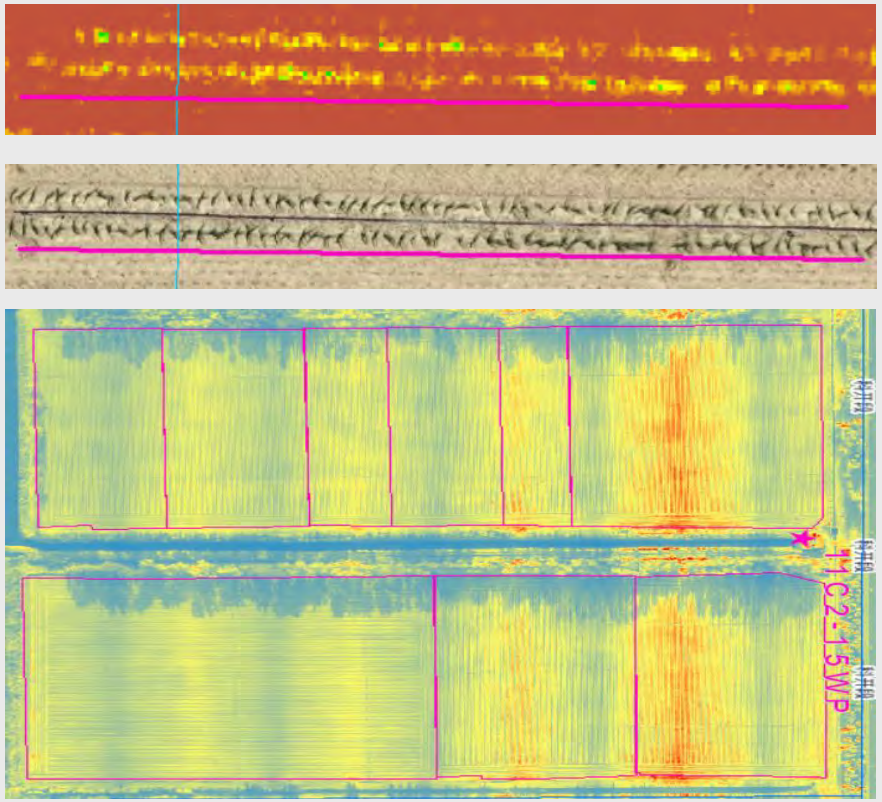


A new data infrastructure to support this strategy

DJ UAVs or similar aerial remote sensing aircrafts are often used to collect data from small farms as resolution of satellite images are not high enough to show the details.

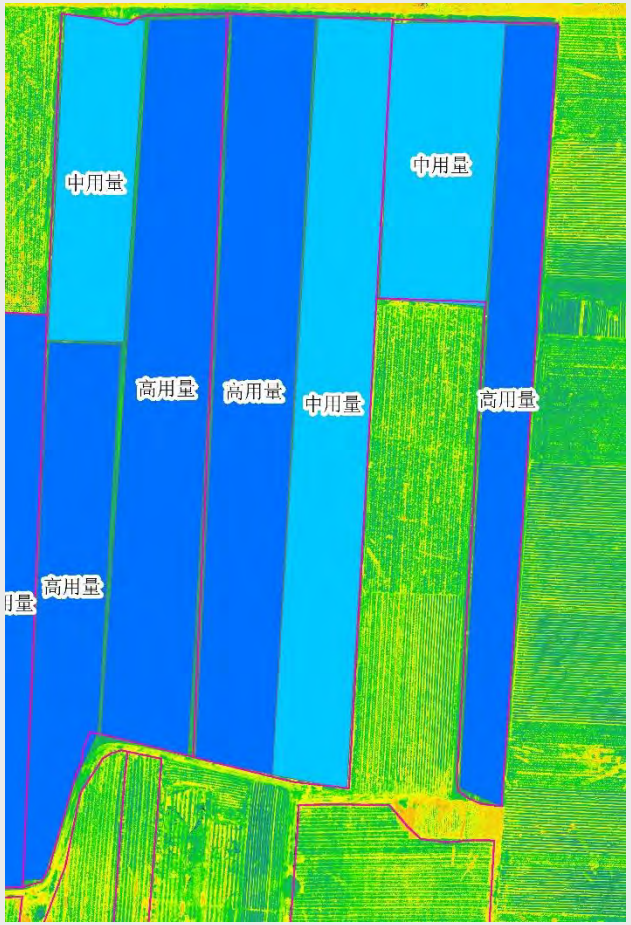
A new data infrastructure to support this strategy

A single flight of a typical UAV can cover 100-200 ha, with multi-spectral sensors, to obtain NDVI, stand count, or crop nutrition status, etc. Images can be processed in 3-6 hours with cloud computing.



A new data infrastructure to support this strategy

Aerial remote sensing data are used to support viable applications such as fertilization or daily scouting.

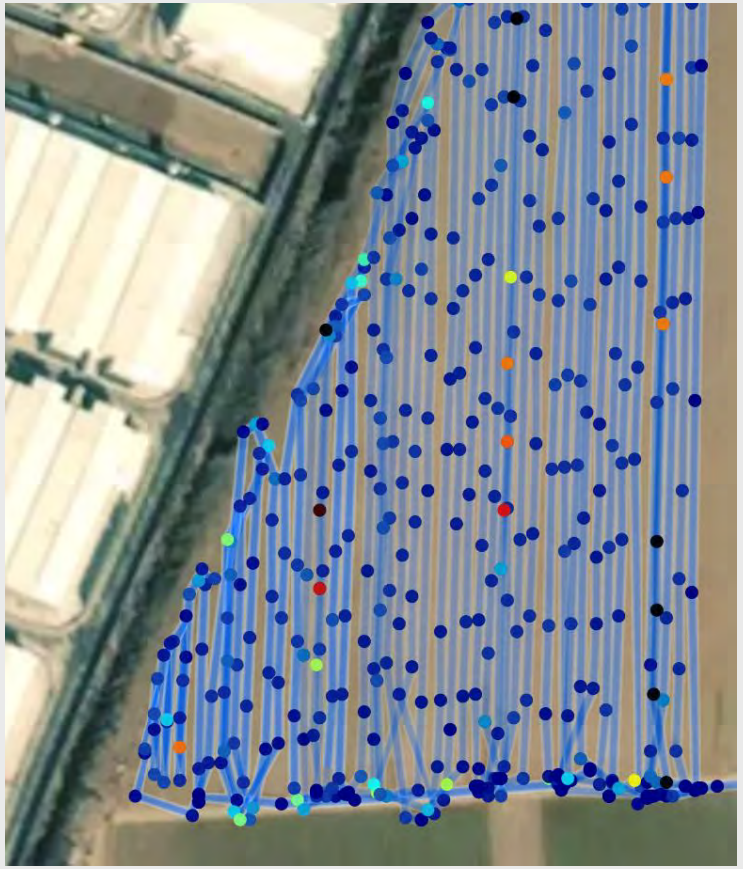


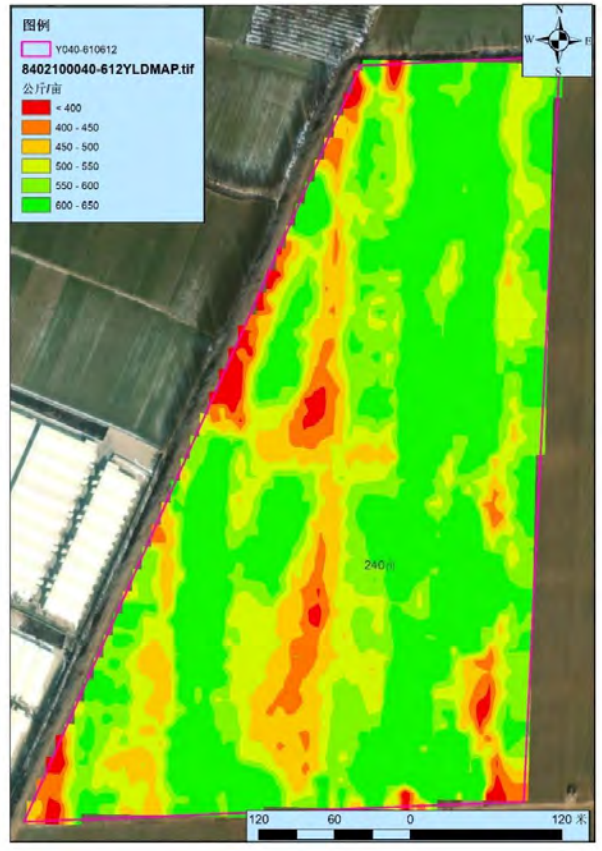
A new data infrastructure to support this strategy

Beidou navigation system has been widely used to upgrade ag-machineries to support more precise guidance, and variable rate applications.

A new data infrastructure to support this strategy

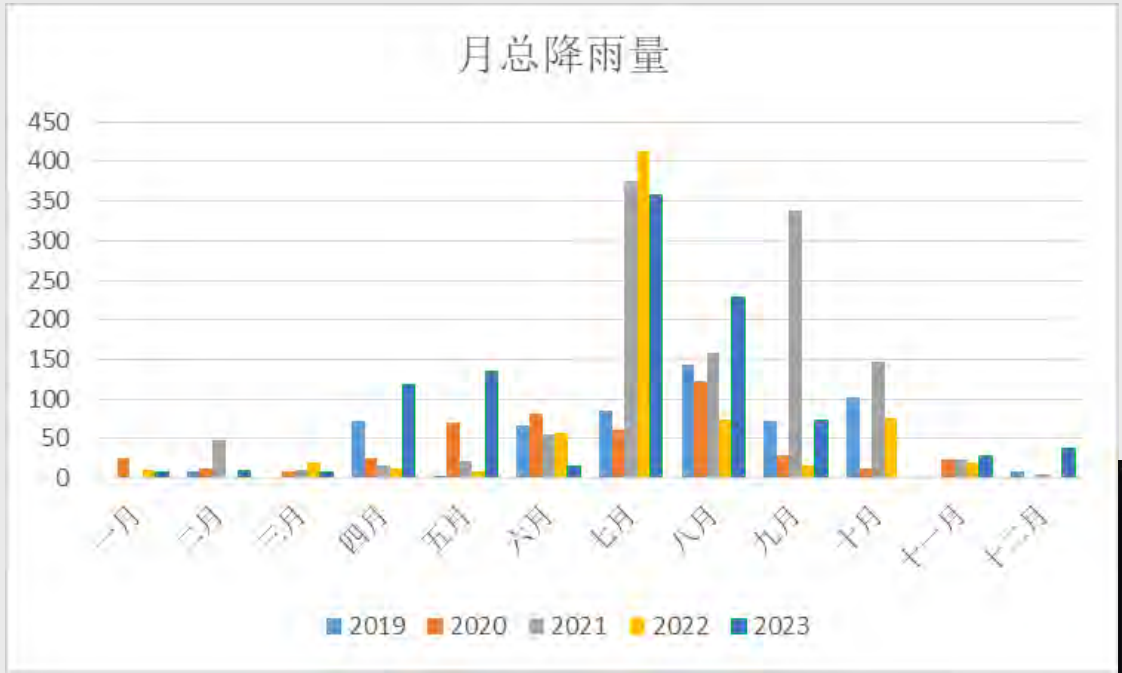
Yield mapping is also being used for small farms for better decision making, and insurance claiming.



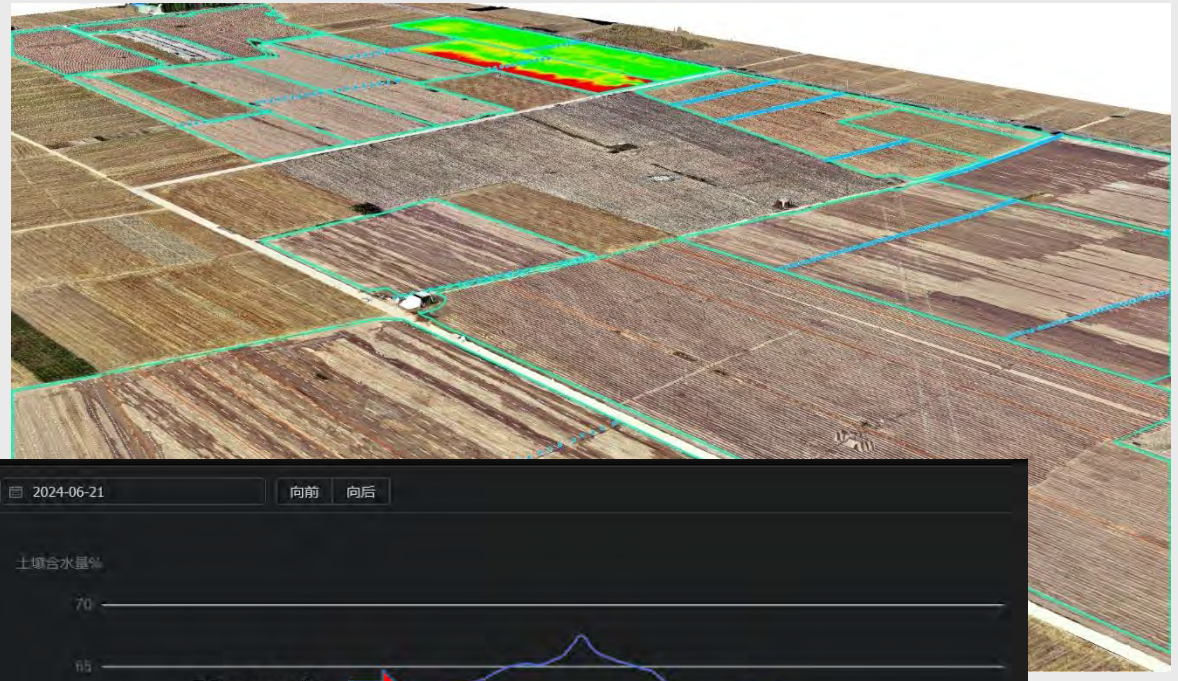


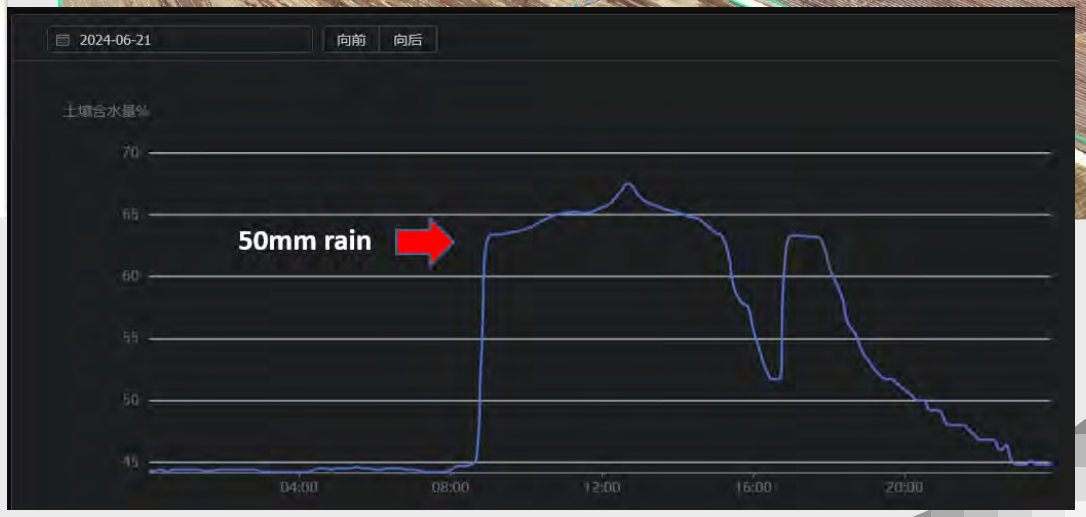
A new data infrastructure to support this strategy

Climate changes will also push small stakeholders to make decisions based on data as old experience may not work anymore when extreme weather occurs.



Anyang, northern Henan Province, has experienced a striking change of rainfall pattern.





A new data infrastructure to support this strategy

Disease warning based on numerical forecast models was broadcasted by government agencies to delivery data analysis results to all farmers, when extreme weather occurred.

植物病虫情报

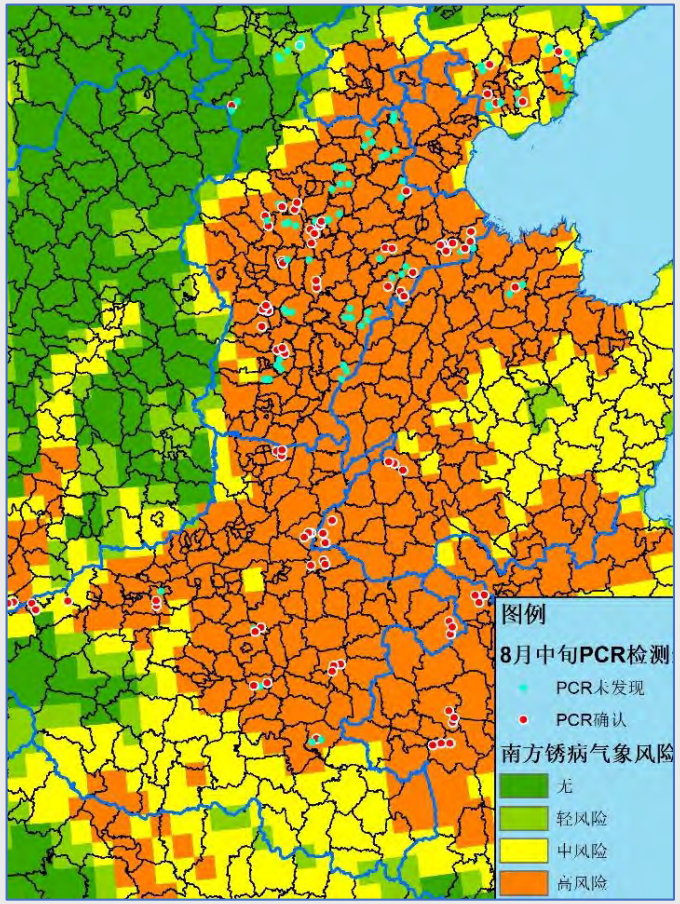
第 23 期

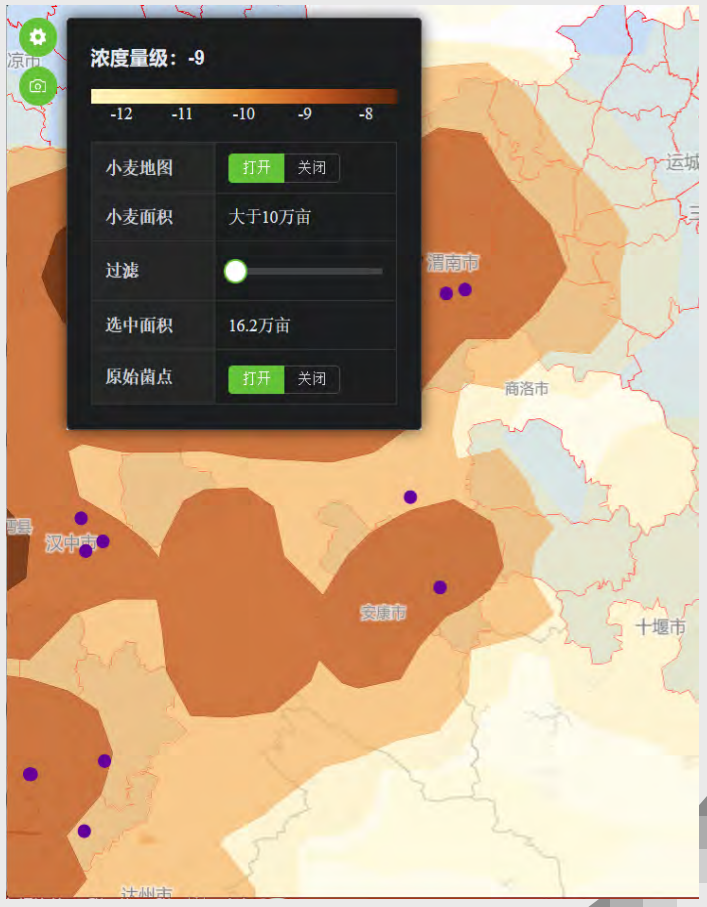
全国农业技术推广服务中心　　2023 年 7 月 30 日

警惕台风“杜苏芮”过后
玉米南方锈病在江南和黄淮海暴发流行

近期，第 5 号台风“杜苏芮”（DOKSURI）在我国东南部地区登陆，且残余环流向北偏西深入内陆，带来雷暴大风和大量降水，其发生强度大、涉及范围广、北上影响强，为玉米南方锈病的跨区大范围传播和下阶段集中显症提供了非常有利的条件。综合分析菌源传播路径、未来天气条件、寄主品种抗性和栽培管理制度等影响因素，预计今年玉米南方锈病在江南大部和黄淮海夏玉米主产区大发生，对玉米生产安全构成较大威胁；全国发生面积 8000 万亩，流行盛期为 8 月中旬至 9 月中旬。

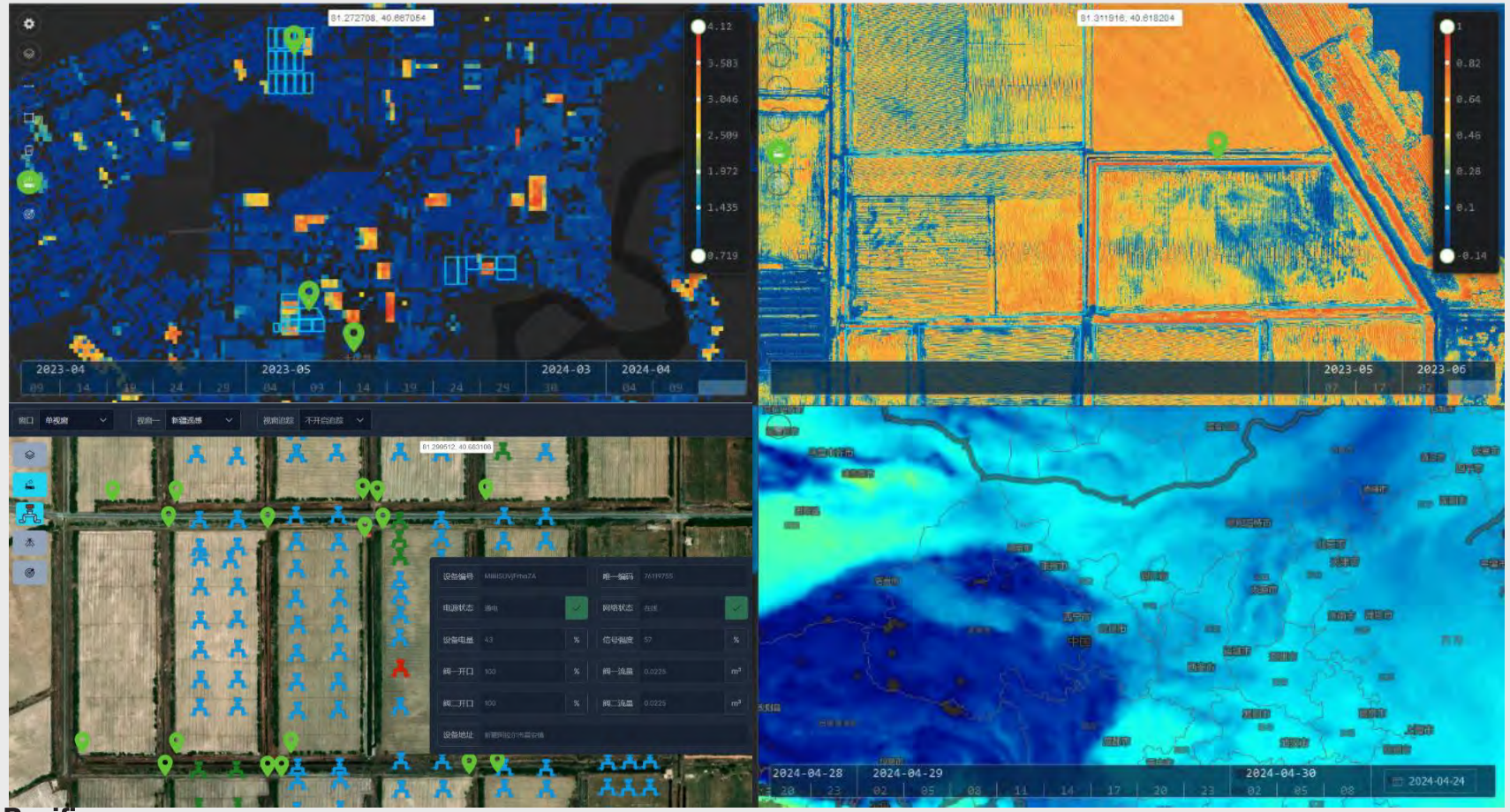
一、发生风险





A new data infrastructure to support this strategy

Various data sources must be linked together using cloud computing platform and used together for farms to understand a digital world. Yet, training programs are still problematic.



What shall be done for the next……

- Affordability of data seems not a problem, but accessibility and data analysis are huge problems.
- Small stakeholders still need time to learn how to make decisions based on primary and secondary data.
- Education and training will be extreme important for the younger generations of farmers.
- A systematic and coordinated work across different industries for digitalization of rural areas is needed.
- Commercialized services of digital agriculture will be the key driving force for sustainable agriculture in future.
- Climate changes will also inevitably drive the development of digital agriculture and policy making.
- Collaborative work among different economies will help greatly.

Thank you.

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