Abstract ： Wheat is one of the most important grain crops in China. Its long growth cycle and wide distribution makes it easily susceptible to a variety of stresses and disasters. In order to promote the management and control capability of wheat production through strengthening diagnosis and prediction of wheat growth status, a remote monitoring and diagnosis system was designed and realized based on the Internet of Things (IOT).On the basis of the accumulated results of early period research and layout both in software and hardware, the crucial data (including HD image and video) related to wheat growth and meteorological disasters were acquired quickly and steadily by technical integration of heterogeneous networks, such as wireless sensor network (ZigBee) and LAN (Wi-Fi), mobile communication (GPRS/3G), Internet or VPN, etc. Simultaneously on the server side, the system can provide decision supporting services for making a final intelligent diagnosis of wheat growth status and disasters with a combination of network database, statistical algorithm, computer control and inference engine etc., according to the monitoring data and characteristics of the crops and meteorological condition.The monitoring system was developed under the construction of Browser/Server mode with C# language on .NET, and further designed with a 3-tier application framework, which included data layer, data access layer, logic layer and the presentation layer respectively for data acquisition, data process, and data storage. By such optimal methods, advantages of the system are ensured in keeping excellent object-oriented functions, better compatibility and suitable systematic standardization in follow-up development.The system consists of six modules individually designed for data acquisition, knowledge specification and normalization, intelligent diagnosis and analysis, user management, assistant help for system management and application. These modules are mainly responsible for receiving dynamic data from remote sites, knowledge specification and normalization, and definition of the diagnosis indexes for crop and meteorological disasters, etc. By the utility of monitoring data combined with crop and meteorological index specifications, the system may give precision and rapid diagnosis of the condition and probability for both wheat growth and main meteorological disasters, which includes drought and waterlogging, low temperature, and dry and hot wind. In order for precision diagnosis of wheat growth and development, four grades are classified according to the crucial factors below: numbers of leaves on main stem, numbers of stems and tillers per plant, and numbers of secondary roots and tillers. Those parameters are obtained from field experiments or knowledge and experiences from different agricultural experts.The results of these diagnosis and decision supporting services can be output in multiple forms, like MS word document, different type of curves and figures, as well as data sheets depending on the user’s option. With the integration of web services and socket techniques, users can easily get the multi-source data resources and information services via the platforms, such as mobile terminals, LED screens, flat pad, personal computers, etc. Demonstration and actual application of the system has been successively carried out in the main wheat production regions of China, and the results show a quite significant prospect for remote intelligent management and precision monitoring diversification of meteorological disasters by the integration of IOT technology.