

Agricultural Environment Management Expert System for ARI

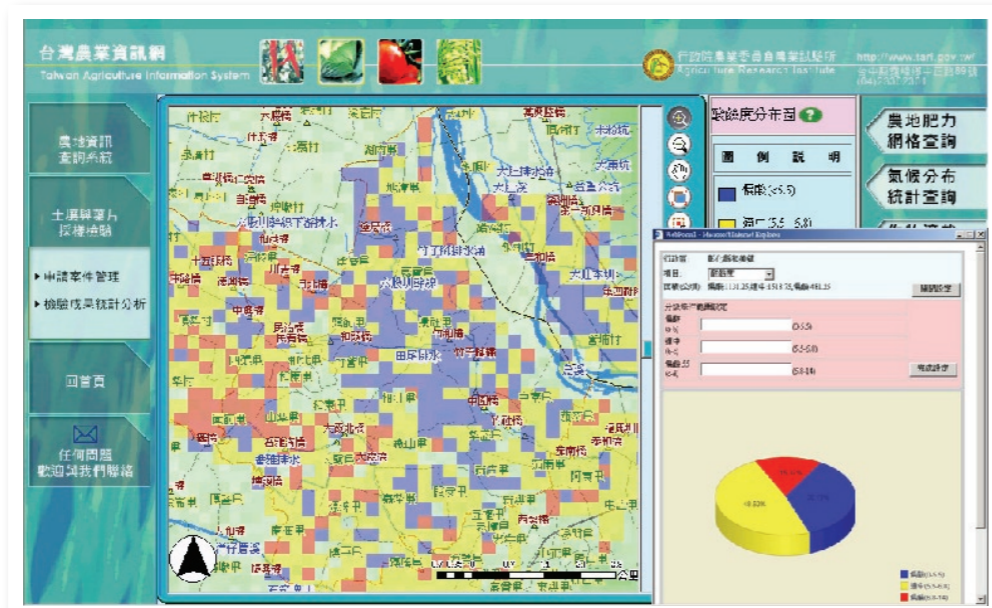


Challenges

- The target users of the system are farmers, so the interface design and manipulation will influence the will of users to use this system.

Goals

- Through spatial data integration, distribute field survey results effectively as references for farmers in cultivating crops.



The system interface

Scenario

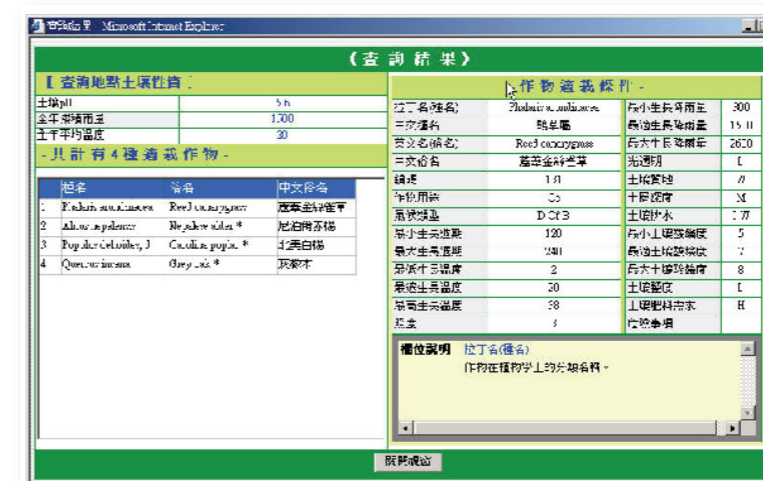
The Agriculture Research Institute (ARI) under the Council of Agriculture, Executive Yuan, was established in August 1895. In the past one hundred years, ARI had devoted great efforts to increase the yields and qualities of grains, special crops, fruit trees, vegetables, and flowers and to improve the economic development of farming villages. As a result, a great number of research performances are presented.

ARI has field surveyed the soil resources in Taiwan for many years and has already collected a great amount of records in very detail. To have these records be used effectively with its utmost value, ARI plans to construct an Internet Service GIS Query System, so the general public can query the characteristics of soil in every district in Taiwan on an online platform. With the system, research units such as the Agricultural Research and Extension Stations are allowed to rapidly and conveniently access complete soil characteristics and associated environmental information. More, the researchers and farmers are able to manage farms with more efficiency and

obtain information on agriculture producer services. As a result, agricultural products produced can be of increased quality and the impact on environment during developing can be reduced.

Challenges

To effectively make use of the surveying records of the soil resources that ARI has collected and accumulated for many years, a workflow that can calculate the input data needs to be designed. The workflow shall integrate all data, import data into database, operate and allow users to obtain the reference information on only one platform. Since the target users include both researchers and farmers, in order to allow the farmers and the associated users to easily manipulate and query, a user-friendly design of the user interface and smooth manipulation steps become one of the focuses in planning the system.



Querying the suitable cultivating environment of crops

Goals

In drawing up the project, the construction of foundational crop database is a key link to all. With this database, results and data from many different research units can be integrated together, which saves much time and work on data processing. Since the data from those concerned units have been integrated to one, more methods with different aspects are available to be applied, thus improving the application values of analysis results.

More, with the far-reaching characteristic of the Internet service, using the Internet Server GIS as a platform to distribute messages allows users from everywhere, whether farmers or researchers, to query the needed information online, such as the crop's suitable cultivation analysis, soil information and so on. People do not need to spend extra time going to the concerned units in person and wait for the results and paper works. Furthermore, some advanced analysis and querying functions are developed for the researchers' needs.

Solutions

The project uses SuperPad and SuperWebGIS as the tools to perform field surveys, inspections and building the Internet Service GIS platform.

With a characteristic of being able to be installed on hand-held devices, SuperPad is capable of reading several data formats

for overlapping purposes and is equipped with many other functions such as edit, data query, GPS spatial positioning and so on. With it, surveyors can perform field surveys on-the-spot or reconfirm the data that were collected to strengthen the correctness of data and to increase the applications.

After the data have been collected fully, developers can draw up a full set of workflow system to calculate the input data and use SuperWebGIS to design an Internet Service GIS online platform. By then users can easily query crop information by map-to-text or text-to-map, by clicking the online map under an environment with the Internet service. The user-friendly interface and simple manipulation steps of SuperWebGIS web allows farmers or other users to easily attain the information they need online.

Results

The goal of constructing this system is to effectively integrate the abundant surveying results of soil resources and to perform cross analysis through inputting data into the foundational crop database. This way, valuable reference information can be obtained to assist farming management and for agriculture concerned authorities of every level to make policy analysis. The target of harvesting premium agricultural products and reducing the impact on environment during the development can also be achieved.

Solutions

- With SuperWebGIS users can query spatial information of crops and manipulate map online under an environment with the Internet service.
- SuperPad can overlap layers of different formats and its spatial positioning function allows crop information to be collected on-the-spot.

Results

- The construction of foundational database strengthens the integration efficiency of data from every research unit and enhances its usage performances. Moreover, the online distribution platform allows farmers to query the suitable cultivating environment of general crops and allows researchers to perform advanced analysis and query functions developed specifically for them.

Products

- SuperWebGIS 2
- SuperPad 2