

Agricultural Weather Stations Optimize Farming Productivity*

Vaisala's new low-cost MAWS201 Mobile Automatic Weather Station is ideal for agricultural applications. This easy-to-install mobile unit is a user-friendly solution for accurate weather monitoring in farming conditions.



* This story has been adapted from a translation of an article in Japan's "Farmer's Business Magazine", September 1998. The article was written by Mr. Yoshihiro Gotoo from Agricultural Technology Communications Inc. in Tokyo, Japan.

Farmers understand the importance of weather conditions and listen carefully to radio and television weather forecasts.

To increase the productivity of farming, it is essential to know the light, temperature, moisture, carbon dioxide and other conditions. Because farmers understand how important these factors are, they listen carefully to radio and television weather forecasts, as well as using temperature and humidity instruments and in some cases even more advanced instruments to monitor the weather conditions.

In the past, very few farmers acquired expensive instruments such as weather stations for their own use. According to the author of this article, these advanced systems were considered the domain of public organizations. But today the situation is changing, and weather observation systems are playing a greater role in agriculture.

Applying weather observations in agriculture

In Israel, unlike Japan and many other countries, weather

stations are already used extensively in farming. Differing attitudes about environmental conditions are one reason for the contrast between these two countries. In Israel, the connection between the weather and farming conditions is widely understood and well documented.

The goal of one project in the country is to improve ventilation efficiency in greenhouses. Measurements of wind speed and direction play a critical role in this effort. The efficient use of light is another issue in greenhouse farming. Instead of growing crops in direct sunlight, Israeli farmers use a special covering material to create reflected light.

Whether crops are grown in a greenhouse or a field, the temperature of the leaves and evaporation conditions are critical factors in photosynthesis. Solar radiation and temperature have a direct impact on ambient humidity, so measurements of these conditions are crucial.

Measurement instruments are being developed to support accurate real-time control of

environmental conditions in greenhouses. In open fields, meteorological measurements and information on evaporation can be utilized to plan and control the irrigation system. The effect of environmental conditions on growth rates and productivity is also an important measurement parameter.

Ideal for farming applications

Weather stations have long traditions, of course, but until now special knowledge has been needed to operate them, and the prices have been high.

Vaisala's MAWS201 weather station is easy to install and move, and no special tools are needed to assemble it. The unit comes with a carrying case and weighs just 15 kilograms. When used with a solar panel, it can be operated in locations outside the electric power grid.

The basic measurements made by the weather station are wind speed and direction, temperature, humidity, sun radiation, rainfall and pressure with data logging. Optional

instruments can be added to measure net radiation, soil temperature and water levels. The quality of the measurements rivals that of much more expensive instruments. Almost all the sensors pass the requirements of the Japan Meteorological Agency.

The stations are specially designed for outdoor use. They are made of corrosion resistant aluminum with waterproof connectors and cables.

The measurement data can be analyzed with a PC. To utilize the data to raise crop productivity, the author recommends taking measurements from various places, both indoors and out, and then analyzing the data. ■