

## **New method for measuring carbon dioxide for more effective agriculture**

**A new portable instrument for measuring carbon dioxide in greenhouses and animal stalls has been developed by the Swedish company Telaire Europe AB. The instrument, with its own computer program, makes it easier to control the carbon dioxide level and therefore the rate of growth for tomatoes, cucumbers, beans and various leafy vegetables.**

Carbon dioxide works as a fertilizer for plants and an extra supply of CO<sub>2</sub> can improve the plant's growth. Too much CO<sub>2</sub>, however, means that the plant's cooling system hinders growth. Similarly, chicken hatching at poultry farms can be controlled by varying the carbon dioxide level.

Telaire 2001VTC is a new instrument for measuring carbon dioxide levels in the air. The instrument consists of a sensor and a computer program for adjusting vents. It is the first portable instrument of its kind and an inexpensive and easy- to-use alternative for controlling the carbon dioxide level in greenhouses and animal stalls. The program operates in the DOS/Windows environment and can be downloaded free of charge from the company's home page or ordered on a diskette.

"With this method, farmers, agronomists or other personnel can carry out their own measurements and keep a check on the carbon dioxide level", says Arvid Egeland, president of Telaire Europe. Previously, measurements could only be carried out by stationary sensors which were installed by ventilation consultants.

### **Demand for increased caution**

Carbon dioxide functions as a fertilizer in greenhouse cultivation. According to the Swedish University of Agricultural Sciences, caution is required because too high a level of carbon dioxide can cause the leaves' stoma to close. Water leaks out and cools the plant so that it grows more slowly.

Carbon dioxide is an insidious gas; it carries almost no odour and it is difficult to recognize when the concentration is rising. The gas is safe in low concentrations but life-threatening in larger concentrations. Every human being exhales up to 70 liters per hours of CO<sub>2</sub> with a concentration of 50,000 ppm. When that level is reached in a building, the gas is toxic.

Vision is blurred and a person loses his bearings. If the level rises over 100,000 ppm there is a risk of unconsciousness and that a person can suffocate. The risk of accidents has also increased in the past six years because many more deliveries of CO<sub>2</sub> are arriving in bulk, at the same time that industry is using millions of tonnes of carbon dioxide every year.

## **High levels in homes and workplaces**

The best air is always outdoors where the carbon dioxide level varies between 350 and 450 ppm. Indoors, however, the levels are considerably higher because buildings are becoming much better insulated. Public authorities in various countries, including the Swedish Board for Occupational Safety and Health and ANSI in the USA, have developed a norm for an acceptable carbon dioxide level at workplaces of 1,000 ppm. This can be compared with spot check measurements in bedrooms in Sweden of up to 5,000 ppm for two people. Even at concentrations of 1,400 ppm many people complain of fatigue and headache.

## **Facts about Telaire and 2001VTC**

Telaire Europe in Delsbo develops and manufactures sensors for demand controlled ventilation. The majority of the products are exported to Europe and Asia. Telaire 2001VTC is used to identify the need for ventilation, control the air flow and measure how quickly the air is exchanged in a space, and to adjust fans and other equipment for controlling ventilation. It measures both temperature and carbon dioxide level with the help of an infrared NDIR-technology and is completely automatic and self-diagnostic. VTC2001 is available in two styles, one with an 11-hour 1100 mAh standard battery and one with a rechargeable battery with 2 hours operating time. There is a warning system for low tension. The sensor is compatible with EMC 89/336/EEC-directive, measures normally at 1-3,000 ppm but can handle even higher values outside the scale. The measuring values are shown with a four-digit LCD display.