

# In Brief

## Home Fuel Saver

Recently, NRC physicists developed a solid state compact timer device designed to control home thermostats. The original design, when wall-mounted under the existing unit and simply touch-programmed by its user, generates a small amount of heat sufficient to deceive the thermostat into reacting as if the entire room has been heated to the same level. As a result, the furnace is triggered less frequently and one or more cool-off periods are embodied into the home's heating regime. Activation times and temperatures, once chosen by the homeowner, are repeated in a daily cycle.

Since this device was first described in *Science Dimension* (1977/6), additional articles appeared in Canadian, U.S. and European publications. Subsequently, numerous companies, both domestic and foreign, expressed interest in obtaining licensing rights. Recent developments call for the manufacture of a more sophisticated version of the original solid state timer, one incorporating a microcomputer as well as a built-in thermostat with temperature and time display. This newer model was also designed and tested at NRC, and a licence for its manufacture was granted to the Ottawa-based company Knowles & Haddow Ltd.

## Aid to Dairy Farmers

Saving the average dairy farm \$5,000 per year by reducing production losses and veterinary fees would be no mean feat, and if a recent development by SED Systems Limited of Saskatoon measures up to expectations, just such a benefit could be in store for Canadian farmers. With financial support from NRC's Industrial Research Assistance Program, the firm has produced an automated system for the early detection of mastitis in dairy cattle. If this bacterial inflammation of the udder can be treated in its early stages with antibiotics, the loss in milk production will be minimized. The instrument, which operates "on-line" as the cow is being milked, measures the electrical conductivity of the milk, a characteristic that changes with the onset of the disease condition. SED Systems Limited intends to market the innovation throughout Canada and the United States.

## Guildline Instruments:

Guildline Instruments Ltd. of Smiths Falls, Ontario, the major producer of electrical standards equipment in the world, has achieved international re-

nown for the excellence of its instruments. From its early years, Guildline has maintained a close working relationship with the Divisions of Electrical Engineering and Physics at NRC. The success of this cooperation is reflected in the Federal Government's Canadian Patents and Development Limited receiving almost 10 per cent of its royalties from Guildline's multi-million dollar sales at home and around the world. Their early effort in producing instruments based on the NRC-developed current comparator established international leadership in the marketing of products for the measurement and maintenance of standards for current, voltage and power. Through further collaboration with NRC, Guildline has developed sophisticated oceanographic instruments for precise measurement of depth, temperature, pressure and electrical conductivity.



Bruce Kane, NRC/CNRC

**Uniroyal Limited, aided by an IRAP grant, was able to synthesize Vitavax and Plantvax, the first two of the practical systemic fungicides. Tests on barley (healthy and diseased plants above), oats and wheat, susceptible to smut and rust, have shown that treatment with the fungicides controls the organisms which cause disease and leads to increased crop yields. Vitavax and Plantvax have now found worldwide markets.**

Uniroyal Limited, avec l'aide d'une subvention PARI, a pu faire la synthèse des deux premiers fongicides systémiques, Vitavax et Plantvax. Des essais sur l'orge (ci-dessus, plants sains et infectés), l'avoine et le blé, enclins au charbon et à la rouille, ont démontré que ces fongicides combattent les organismes pathogènes et permettent d'accroître les récoltes. Le Vitavax et le Plantvax ont désormais des marchés mondiaux.

## Rapeseed:

Basing their estimates on seeded acreage, agronomists predict that Canada's 1978 rapeseed crop will be worth about \$600,000,000 to Canadian farmers. Now third in the nation's production behind wheat and barley, rapeseed is, to a large extent, a crop developed in the laboratory, with NRC's Prairie Regional Laboratory playing a key role in the research activity. During World War II, rape oil use was confined largely to steam engine lubrication due to the presence of certain substances that rendered it unsuitable for human and livestock consumption. To provide Canada with a much needed edible oilseed crop (as well as to diversify Western Canada's agricultural economy), Prairie plant scientists set out to get rid of the undesirable substances in rapeseed (chiefly erucic acid and glucosinolate compounds). To this end, PRL chemists developed sensitive assay techniques that were used successfully by Agriculture Canada plant breeders to produce rapeseed hybrids in which these substances were absent. Today, their so-called "double zero" varieties supply Canada not only with its own domestic source of edible oil, but with a valuable export commodity as well. The rapeseed story is an excellent example of the industrial pay-offs that accrue from scientific research.

## Quality Control with Light

The headstart and early support provided by an NRC IRAP grant have helped a Canadian company to reach a very strong and competitive position in the high-technology area of laser and optical inspection systems. Located in Windsor, Ontario, in the heart of North America's automobile industry, Diffracto Limited has designed and built several optical inspection systems for the quality control of automobile engines and components on assembly lines, leading to substantial cost savings and increased reliability. Diffracto's optical systems can also be applied to a number of other industrial measurement problems, including the inspection of bottle caps and bottle contents, the rapid and precise measurements of hair samples for shampoo manufacturers, the measurement of carpet weave and magnetic tape width, and the non-contact weighing of pharmaceutical pills or nuclear fuel pellets. Other computer controlled optical systems allow accurate measurements to be made on such components as the rotating blades of industrial turbines or the aperture masks of color television tubes.