

Agriculture :

Science may increase protein content of crops

A scientist working for the National Research Council of Canada has recently recorded a breakthrough in investigation of the process which produces protein in vegetables. This could lead to ways of artificially increasing the protein content of legumes such as peas and beans. It is also possible that it could enable scientists one day to introduce protein into non-legumes such as wheat, though the NRC emphasise that this is a long-range possibility.

The breakthrough recorded by Dr. J. J. Child at the NRC's Prairie Regional Laboratories at Saskatoon involved the cultivation of the nitrogen fixing bacteria "rhizobia" alongside, but separated from, the cells of various plants they normally inhabit. Up to now the bacteria have never been known to carry out this process, essential to the production of protein, except within the plant cells. Scientists have been trying to induce them to do so for about 80 years.

Dr. Child grew rhizobia alongside various plants and observed that they carried out their nitrogen fixing even though separated from the plants. This indicates that whatever it is in the plant cells that enables the bacteria to do this work, it is a substance that can pass outside the cell walls and diffuse across the space separating the cells from the bacteria.

By analysing the materials found in this space, scientists may now be able to isolate for the first time the plant substance the bacteria use. And because the process also worked when the bacteria were cultured with non-legumes such as wheat, the substance is now known to be present even in plants which cannot obtain nitrogen from the air.

The NRC say that Dr. Child's experiments open up a new field of research. When the plant component needed for nitrogen fixing has been identified, scientists will be able to start searching for ways to make the nitrogen-fixing process more efficient.

The Prairie Regional Laboratories have been working on the nitrogen fixing process for more than five years. As often happens, their finding was published simultaneously with similar results from Australia — though the NRC claim that Dr. Child was about four months ahead of the Australians. ♦

Blacksmiths go to college

With the returning popularity of horses, particularly farm horses, across Canada, an old trade has been crying out for new recruits. Where have all the blacksmiths gone? So Algonquin College in eastern Ontario has come forward with a typically modern answer to the problem: a college course for blacksmiths.

Ten students enrolled for the first twenty-week course earlier this year, working five days a week in a barn at Equidae Stables, twelve miles south of Ottawa. Among them was one woman student, Daphne Lane, 24, who succeeded after some difficulty in persuading the federal Manpower Department that a woman could and should enter this traditionally male trade. Perhaps they'll re-jig the old blacksmith song in her honour:

"My true love I hear,
Her anvil is ringing
Her voice it is singing . . ."

The course is essentially practical. Before they progress to shoeing live horses, the students practise on hooves severed at the fetlock, which serve them as cadavers do medical students. Dan Dunwoodie, a blacksmith with twelve years' experience, teaches the anatomy and physiology of horses, drawing particular attention to hoof defects. He also teaches them how to deal with balky horses.

His pupils learn to "roll a shoe from bar stock," a technique that was being practised by blacksmiths a century and more ago. They make their own tools with hammer and welding torch.

With a recent survey showing ten thousand horses in the Ottawa valley and around a million across Canada, graduates should have no employment problems. Mr. Dunwoodie says: "At the moment about fifteen blacksmiths are working in the area and they're always overbooked."

A difference in the trade today is that where people used to bring their horses to a static forge, nowadays it is more usual to make house calls. Mr. Dunwoodie expects his students to set up mobile units. "It's often easier to go to the customer than have the customer come to you." ♦

New McIntosh apple grows scab-free

There's an apple orchard in Ottawa where Sir Isaac Newton might well have missed his chance to discover the law of gravity. Instead of the big, red apple which struck him so forcefully on that historic occasion, the chances are that sitting under a tree in this orchard, he would be hit by a specimen too small and shrivelled to make the point.

The orchard on Agriculture Canada's Central Experimental Farm has not been sprayed with the usual fungicide against scab disease since it was established ten years ago. Many of the trees are McIntosh, a variety which normally produces juicy red apples popular in the supermarkets — but which without spray suffer from scab, resulting in shrivelled apples covered with ugly marks and sparse growth.

Among the diseased trees, however, are some healthy ones whose branches are weighed down with fine apples. They have not been sprayed, either, but belong to a new variety named Macfree which is resistant to the disease.

These trees are the product of years of research by Dr. L. P. S. Spangelo at the research station in Ottawa, work which is now being carried on at research stations in St. Jean, Quebec and Smithfield, Ontario. The new variety is a McIntosh type and is considered to have proven itself in Ottawa — indeed, small quantities were made available to the nursery trade earlier this year. As it becomes more generally available it should lead to immense savings of time and money for commercial producers. ♦

Blacksmith invents bale-handling machine

A new machine which solves the awkward problem of handling round hay bales has been invented and marketed by an enterprising inventor in Killarney, Manitoba.

Bob Shaw, a former blacksmith and mink rancher, learned about the need for such a machine when he was repairing a round-baler — an efficient machine which produces huge bales, fifteen hundred pounds in weight and almost six feet in diameter. Farmers were in difficulties over loading them and transporting them back to the farm yard for cattle feeding.

With his co-worker Ken Vandenberg, Mr. Shaw tried out several ideas before settling on the one he has marketed. It is hydraulically operated and can pick up three bales in less than five minutes. To produce it, he had the backing of five friends putting up C\$30,000 in collateral, the local bank adding a C\$60,000 loan and a team of government experts providing counselling assistance.

When the finished bale carrier was unveiled, the manufacturer of the round baler immediately ordered 60 of the implements for distribution throughout the Canadian Prairies and northern United States. Mr. Shaw's firm, registered as B and K Industries, is situated on his farm in two buildings. About six men, all welders and metal cutters, are employed producing three of the carriers a day. ♦