PERSONAL

profile...

Chief of TVA's development branch directs pilot planting of new fertilizer manufacturing methods

Travis P. Hignett

Born Dec. 30, 1907, Maxwell, Iowa. A.B., Drake U., 1929. Chemist, Fixed Nitrogen Research Laboratory, USDA, 1929–33. Chem. Eng., Research Associates, Inc., 1933–38. Chem. Eng., TVA, 1938–47; Chief, Development Branch, TVA, 1947 to date.

SOME PARTS of the Tennessee Valley Authority's fertilizer programs receive criticism, but TVA's work on developing new materials and processes generally receives kudos. As chief of the Development Branch of TVA's Division of Chemical Development, Travis P. Hignett is responsible for bringing new or improved processes through pilot plant stages to industrial use.

Although best known for its development of fertilizer processes, TVA's Development Branch carries out a varied program. It has included several defense projects, and projects on wood hydrolysis and sulfur recovery from flue gas. These are carried out in cooperation with other government agencies such as the Army Chemical Corps and AEC.

Large and small fertilizer manufacturers, as well as farmers, have benefited from the TVA fertilizer development program. But rewards of a kind also go to those who do the work. Seeing how quickly and completely manufacturers put into practice some of the TVA plant design information and operating data is a great part of the job satisfaction Hignett receives. He doubts if he could find such rewarding work in any other field.

Although a chemist by training, Hignett has always done chemical engineering work. His first job after college, with the Fixed Nitrogen Research Laboratory, involved mostly chemical engineering. So Hignett began a self-study program in chemical engineering theory at night, learning the practical side during the day.

Cottrell's Influence

FNRL was headed by Frederick G. Cottrell, a visionary scientist particularly adept at predicting commercial applications of fundamental research. His association with Cottrell and with P. H. Royster, his immediate supervisor, inspired Hignett to concentrate in development work, and has helped him to see the future of his work clearly through the maze of side routes initial research often opens.

In 1933, Cottrell formed Research Associates, Inc. Hignett left the FNRL to join Cottrell's company. Research Associates had the idealistic objectives of developing inventions of scientists to commercial processes, and of using the profits from the developments for more research. However, it was not a financial success.

TVA Career Begins with Cal-Meta

Joining TVA in 1938, Hignett began his career inauspiciously—as night shift pilot plant supervisor for the calcium metaphosphate work. During World War II, the urgency of war projects set aside much of the TVA's fertilizer development work. Hignett, by then a project leader, worked on processes for extraction of alumina from clay, coal carbonization, and production of aluminum-silicon alloy.

After Hignett became chief of the Development Branch in 1947, he and others at TVA looked for ways to make information—the Division of Chemical Development's only product—more widely known. Generally after a project appeared commercially feasible, a report of its development was written. These reports (which like all TVA reports are public information) and some articles published in scientific journals concerning the developments seldom got a second look by industry. Efforts were only moderately successful until the TVA pilot plant demonstration programs began in 1953 in cooperation with the National Fertilizer Association.

Hignett and his associates were amazed at the number of people who attended demonstration programs and started making use of TVA processes. Small fertilizer manufacturers immediately scaled up TVA pilot plants with minor changes. For example, local boiler makers built TVA ammoniators for these smaller plants, as owners struggled to keep costs down.

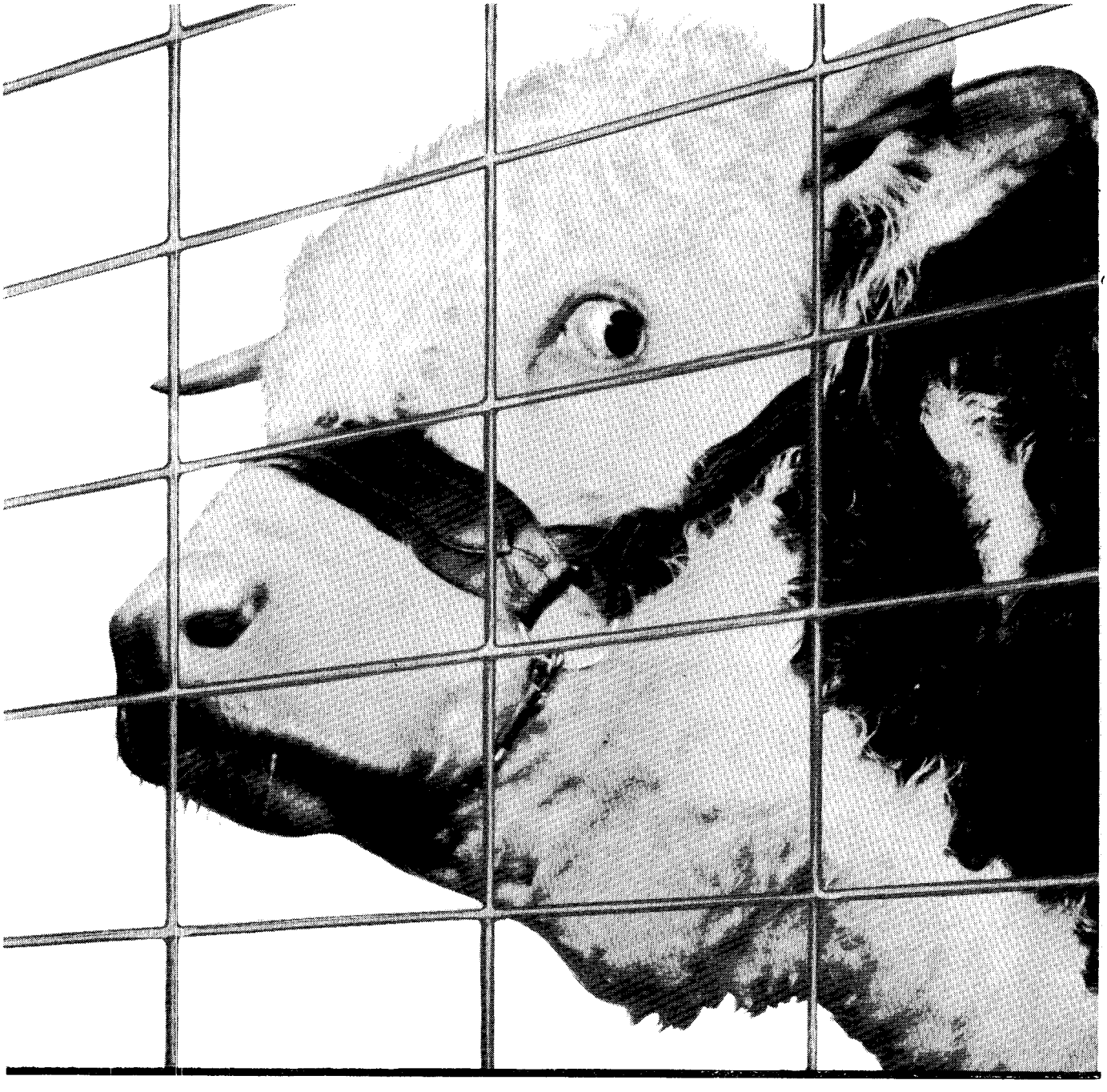
In addition to his work on continuous ammoniation and granulation processes, Hignett directed development of diammonium phosphate, and more recently of superphosphoric acid. Says Hignett, superphosphoric acid looks like a natural to make higher analysis liquid fertilizers. The liquid fertilizer made from superphosphoric acid and ammonia will dissolve certain trace elements such as zinc, iron, and copper, whose value in fertilizers is now widely recognized.

Generally, TVA's over-all objective is to develop processes for making better and cheaper fertilizers. More specifically, Hignett directs work to improve fertilizers' physical properties and lower their cost, and to make fertilizers fit a wider range of soil needs.

To achieve these objectives, Hignett tries to keep a balance between projects that will be of more immediate use to the industry and long range projects. Some long range projects hold interesting challenges of early shifts into the immediate use category. But Hignett's experience shows the pitfalls of trying development work with too limited basic data. And basic research sometimes shows how impractical some interesting challenges are.

Hignett is also quick to point out that TVA's developments are staff developments. Hignett directs the branch's operations on the principle that people doing development work should have the maximum freedom to formulate their own procedures and plans of work. "This method seems to speed our work," says Hignett.

Looking to the future, Hignett says it will not be too long before most fertilizer will be granulated, as compared to about 15% of all fertilizer produced now. In spite of efforts to lower granulation costs, they still remain higher than the costs of other methods. However, Hignett points out that savings to farmers now possible through use of higher analysis fertilizers offset granulation's higher costs.



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