

profile...

USDA chemist is a world leader in granulation technology

JOHAN O. HARDESTY, CHEMIST, has been working for the U. S. Department of Agriculture for almost 30 years. Just about all that work has gone into studies in fertilizer technology.

What impresses him most after all this time? In Hardesty's words: "Watching the fertilizer industry grow from a simple mixing operation into a chemical process industry . . . seeing chemical research applied to fertilizer making . . . observing the great strides in granulation in the U. S."

These words might give the impression that Hardesty has been just sitting and "watching" progress fly past his office window at USDA's Plant Industry Station, Beltsville, Md. Nothing is further from the truth. Hardesty, something of a fertilizer chemist's chemist, has had a man-size hand in assuring progress through new developments, especially in granulation.

Hardesty's early years with USDA brought him close to William H. Ross, his first boss and a recognized leader among fertilizer chemists. Ross, now deceased, had started working on granulation about 1920. By the time Hardesty joined USDA in 1930, Ross had built up a decade of experience and know-how in this field.

To this day Hardesty is grateful that he had the chance to work under Ross. Together they helped to make the country granulation-conscious, although granulation did not take hold on a wide basis here until about 1950.

England, in the meantime, moved far ahead of the U. S. As a result Hardesty and some of his colleagues journeyed there in 1950 to study English methods. While there, he participated in a meeting of the Fertiliser Society of England.

That meeting produced a unique coincidence. Hardesty, who had fought in France in World War I, wished to draw a parallel between England's gaining pre-eminence in granulation and an event he had participated in during the war.

During the war, he told the gathering, his outfit had followed a British unit into battle on the front line. Comforting it was to know the British were showing the way. "Just as your men preceded my unit during the war,"

Hardesty modestly went on, "so England has led the way in granulation."

After he ended his talk, a man stepped forward. Fate would have it that that man, then president of the fertilizer society, had been an officer in the British force that showed the way at the front in 1918.

Thanks to Hardesty, Ross, and others, both in government and industry, the U. S. generally can now be said to be leading the world in most phases of fertilizer technology. During this emergence, Hardesty has gained the respect of the entire industry—here and abroad—for his work.

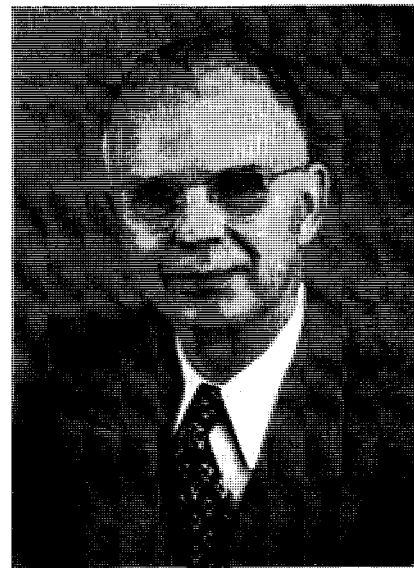
Example: Hector Koch of African Explosives and Chemical Industries, a fertilizer maker, took back to his country, after a visit here, many of Hardesty's ideas on granulation. The result, according to Koch, is that his firm is turning out a far better product than it did. And he thinks more U. S. firms would do well to study and follow Hardesty's advice (see page 748).

That advice comes in the form of a specification run-down on the ideal granular mixed fertilizer:

- Particle size—10-14 Tyler Standard mesh; screen openings of 1.651-1.168 mm.
- Particle shape—spherical.
- Particle structure—95% of the particles should stay intact under a load equivalent to 100 lb. per sq. in.
- Homogeneity—each granule should be up to grade.
- Drillability—product should be free of lumps and keep its original drilling rate for one hour when exposed to 88% relative humidity at 76° F.
- Fertilizer efficiency—product should afford optimum delivery of nutrients to the growing plant.

Hardesty points out quickly that this ideal is almost impossible to accomplish fully. But being perfection bent, he feels it's worth a try.

John Hardesty (he prefers the nickname Jack, but "it didn't take") is a senior chemist of the mixed fertilizer section of USDA's Fertilizer Investigations Research Branch. He got there by progressing through the ranks as assistant chemist, associate chemist, and chemist. His major work still



John O. Hardesty

Born, Oct. 11, 1899, Westfield, Ill. A.B., chemistry, De Pauw Univ., 1924; M.S., Michigan State Univ., 1928. Instructor in general and physical chemistry, Michigan State Univ., 1924-30. Asst. chem., fertilizer research, USDA, 1930-38; assoc. chem., 1938-43; chem., 1943-53. Senior chem., Fertilizer Investigations Research Branch, Soil and Water Conservation Research Division, USDA, 1953 to date. Member, ACS, AOAC.

hinges on granulation. Long range program: finding properties of fertilizer materials that make them suitable for granulation.

Certain of Hardesty's "outside" activities help to keep him on top of fertilizer developments. For instance, he is vice chairman of the ACS Division of Fertilizer and Soil Chemistry. He has been an abstractor for *Chemical Abstracts* since 1931, and coeditor of the Section on Soils and Fertilizers since 1949.

When he isn't busying himself with his work and other professional duties, he likes to do some fishing in Michigan or New England. His other diversions cover the range from light reading to listening to American folk songs.

Before joining USDA, Hardesty taught general and physical chemistry at Michigan State University, where he had earned his M.S. degree in chemistry. His A.B. came from De Pauw. His army tenure was with the Chemical Warfare Service, but that had little to do with his decision to study chemistry, he says. Actually he had started in premedicine at De Pauw; it was there he got a taste of chemistry that made him decide on it as a career. His associates and acquaintances throughout the field of fertilizer technology agree that the decision was sound, and the career has been a distinguished one.