ENTOMOLOGY

Grain Pest Season Here

➤ THE PEAK SEASON is here for devastation of stored grains by one of the most prolific and destructive insect pests in the country, the khapra beetle.

A U. S. Department of Agriculture expert told SCIENCE SERVICE he had seen a bin of barley, 100x40x14 feet, completely ruined by these tiny pests, which were only discovered in this country in 1953. In another bin, he saw khapra beetle larvae and cast-off skins one foot deep.

Since its successful eradication in New Mexico, the khapra beetle is believed to be bottled up in California and Arizona, where it continues to strike at stored barley and grain sorghum with disastrous results. Worried entomologists, however, are appealing to farmers and grain storage men to keep watching for the pest and to report its occurrence in an effort to keep it from spreading.

The khapra beetle, native of India, Ceylon and Malaya, has already spread from Japan, the Philippines, and Australia, to England, Europe and Africa. Although only found here in 1953, some astute detective work by the USDA indicates that it must have gotten into the Fresno area of California as early as 1946.

The insect belongs to the same family as carpet beetles and resembles them. It can be spotted in grain storage facilities by the presence of fuzzy larvae or cast-off skins, about one-eights of an inch long, in clusters around the corners of grain bins or in used sacks. Like rice and granary weevils, it attacks sound kernels of grain.

The only effective remedy for the khapra beetle is to cover infested bins with a tarpaulin and fumigate thoroughly. Fumigation will not hurt the grain for use as feed, the USDA said.

Anyone who thinks he has discovered khapra beetles in stored grains should send specimens to: Insect Identification and Parasite Introduction Section, U.S. Department of Agriculture, Beltsville, Md. Specimens should be placed in rubbing alcohol in a leakproof jar or vial. Do not send live specimens through the mail.

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AGRICULTURE

Germ-Resistant Plants

➤ MAN'S FIGHT against famine is netting startling victories, as new weapons pour forth from atomic laboratories and plant breeding stations that are putting resistance to diseases right into the hereditary make-up of his food crops.

Scientists from all over the country heard of the revolutionary progress in reports given to the American Society of Agronomy meeting in Davis, Calif.

Use of atomic particle radiation to induce hereditary changes in plants that leave them immune to certain diseases was reported by Dr. Calvin Konzak of the Brookhaven National Laboratory.

In his experiment, Dr. Konzak exposed oat seeds to radiation from an atomic reactor. The variety of oats he used was known to be highly susceptible to the fungus disease, helminthosporium blight.

He planted the seeds and, after they had sprouted, inoculated them with the destructive fungus.

Several of the plants from radiation-exposed seeds were resistant to the fungus disease. This resistance was found to be passed on to the offspring of the disease-immune oat plants, showing that the atomic radiation had done its beneficial work by changing the heredity of the plants.

In another experiment to breed disease-fighting power into plants, the high, inheritable resistance to leaf rust of a wild relative of domestic wheat has been transformed to the wheat plant itself, reported Dr. Ernest R. Sears, geneticist with the U.S. Department of Agriculture.

The wild "wheat" used was a member of the goatgrass family, Aegilops umbellulata, which is practically immune to leaf rust. Since it was impossible to cross the goatgrass directly with domestic wheat, Dr. Sears crossed it first with an intermediate plant, emmer wheat. The offspring of these two could then be crossed successfully with common wheat, with the disease resistance being passed on to the resulting hybrid.

The new rust-resistant wheat strains are still far from ready for commercial use, Dr. Sears said. The task of combining the rust resistance with other desirable qualities in a single variety of wheat still lies ahead for plant breeders.

While many plant breeders are looking for naturally-occuring or induced hereditary changes as a source of new and better varieties, Jack R. Harlan of the U.S. Department of Agriculture and Oklahoma A & M College told the A.S.A. meeting that more effort should be spent exploring in foreign countries for plants with the desired qualities already in existence.

Nearly all of the forage crops in the United States were imported here from somewhere else Mr. Harlan pointed out. In bringing them here we have brought only a very small and very restricted sample of the many variations that exist, he said.

As an example, orchard grass in the United States now is restricted in use because of lack of heat and drought tolerance. But in Mediterranean countries there are forms of this grass that prosper with less than eight inches of rainfall a year.

More progress in improving hereditary qualities might be made more quickly and at less expense by introducing these old-world forms than by conventional breeding programs based on current limited samples he said.

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BIOCHEMISTRY

Seek Clues to Inborn Errors in Body and Mind

➤ CERTAIN INBORN errors in body chemistry cause deviation from normal processes, leading to mental deficiency and other ailments is being studied by Dr. Max Dunn, University of California at Los Angeles biochemist, and others aided by grants from Swift and Company.

One such deviation results in inferior mental ability and is known as phenylketonuria. It is the result of a faulty processing of the amino acid phenylalanine.

Another instance in which body chemistry veers from the normal is a rare condition known as alcaptonuria, characterized by marked discoloration of excretory products. Key to the condition is homogentisic acid, which is being structurally explored by the group.

"It is only by scrutinizing these chemical errors in minute detail," Dr. Dunn pointed out, "that we can spot where body chemistry turned left when it should have turned right. From such information can be devised means of correcting harmful deviations in life processes."

Associated with Dr. Dunn in the research have been Howard Wolkowitz, Bernard Kaufman and Machio Yuchida.

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TECHNOLOGY

Flame-Proofing for Cotton Perfected

➤ A FLAME-PROOFING TREATMENT for cotton materials, much superior to previous methods, has been developed jointly by the U. S. Department of Agriculture scientists and the Army Quartermaster Corps' research branch.

A combination of two chemicals that up to now were used separately for flame-proofing cotton are employed in the new technique. In the treatment, one part of BAP, or bromoform-allyl-phosphate, is added to two parts of THPC-resin solution, or tetrakis (hydroxymethyl) phosphonium chloride, and applied to the cloth, which is then dried and heat-cured. The process increases the weight of the cloth about 18%, but shows little effect on other fabric qualities. The flame-proofing holds up well under both laundering and dry cleaning.

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