by nutrition. High potassium on foliage apparently retarded the action of amylase in the conversion of starch to sugar. Stem tissue contained higher percentages of potassium than leaf tissue, while leaf tissue contained the higher percentages of magnesium.

Hessian fly, Phytophaga destructor (Say), in relation to crown and foot rot of wheat. BOOSALIS, MICHAEL G. AND HENRY JEDLINSKI. Experiments were made to corroborate field observations indicating a relation between Hessian fly and crown and foot rot of wheat. The insect-susceptible variety Cheyenne and the resistant Cheyenne × Ponca were infested in the greenhouse before hardening; in a parallel series infestation was accomplished after hardening. Each series contained 6 treatments, 60 plants per treatment and was replicated 4 times. Infested plants were grown in 1) sterilized field soil, 2) unsterilized soil, 3) sterilized sand. Treatments 4, 5, and 6 were similar to 1, 2, and 3 respectively except that the plants were insect-free. Observations during heading stage revealed that about 60 per cent of Cheyenne infested before and after hardening and grown in unsterilized soil was severely infected with crown and foot rot. A less severe rot developed on 25 per cent of infested Cheyenne plants grown in sterilized soil. No appreciable rot was discerned on Cheyenne from the other 4 treatments nor on Cheyenne × Ponca with any of the 6 treatments. None of the isolates per se of *Helminthosporium* spp. and *Fusarium spp.* from diseased plants were pathogenic to wheat. Preliminary results from experiments in which the sterilized soil was maintained aseptically substantiate the above findings.

Jelly end rot of potatoes. BOOTHROYD, C. W., AND R. C. CETAS. Symptoms of a disease resembling jelly end rot were observed in the 1949 and 1952 potato crops on Long Island, New York. The stem end of the tubers rotted. The inner tissue was devoid of starch, high in sugars, and had a wet jelly-like consistency. Failure to find 1 or more microorganisms consistently associated with the rotted tissue suggested a disease of non-pathogenic origin. The average of the minimum-maximum temperatures for the growth period of the potato (April through September) was generally higher for those years in which jelly end rot occurred. Rainfall data for the same period revealed insufficient rainfall for normal potato growth in mid-season followed by adequate to abundant rainfall thereafter. It is believed that high temperature and a low water supply followed by a high one from mid-season on may be important in the incidence of jelly end rot. Data taken at harvest in a potato variety plot revealed a variation in percentage of jelly end rot from 1.7 to 24.3 per cent. Kennebec and Katahdin showed the least jelly end rot, and Cherokee and Canso the most. Seedlings in the same plot showed the same range of susceptibility.

New approach to the breeding of wheat varieties resistant to Puccinia graminis tritici. BORLAUG, NORMAN E. If a commercial wheat variety is to be developed which will have a possibility of remaining rust-resistant indefinitely, this variety must be constituted so that its resistance can be modified to meet changing relative prevalence of different races of *Puccinia graminis tritici.* It is proposed to produce such a "composite variety" by a modification of conventional backcross methods. The variety when distributed commercially, will be a mixture of a number of phenotypically similar lines, which are genotypically different for resistance. The "backcross lines" which are eventually employed in the "composite variety" are developed by crossing a commercial variety to a number of varieties carrying different types of resistance. Each single cross is backcrossed several times to the commercial variety. When the "composite variety" is ready for release, the several lines are multiplied separately, then mixed mechanically to form the variety for release to seed growers. With changes in races 1 or several of the lines in the "composite variety" can be removed or replaced. As many lines can be developed and held in reserve as there are types of resistance. Adequate race surveys, storage of spores by lyophylization technique, and adequate greenhouse testing of each line, are integral parts of this method. Currently we are attempting to improve 5 commercial varieties by this method.

A quick method of determining virus transmission through cherry seeds. BOYLE, JOHN S. Fruits from 10 Montmorency (9 yellows and 1 necrotic ring spot) and 3 St. Medard (2 yellow and 1 no symptoms) were collected in July, 1952, and 250 cleaned pits from each tree immediately stratified in wet peat moss at 35–40° F. In January, 1953, the flats were moved to a greenhouse maintained at approximately 60° F. After germination, young symptomless, cherry seedlings in the 2-leaf stage were selected at random from each seed source ground with 3–5 c.c. of tap water and the extract mechanically inoculated to 4 National Pickling cucumber seedlings using the carborundum technique. A virus was transmitted to cucumber from 25 of 76 Montmorency seedlings and 8 of 15 St. Medard seedlings. Infection occurred on cucumber from all 13 seed sources. The highest percentage of transmission from any Montmorency seed lot was 50 per cent. There was 60 per cent transmission in one St. Medard lot. Forty inoculations (4 Montmorency seedlings from each of the 10 seed lots) to cucumber using older cherry seedlings in the 4 leaf stage that were hardening resulted in transmission in only 2 cases. These data indicate that cucumber may be used to determine the presence of virus in Prunus seed and show seed transmission in higher percentages than previously realized.

The combination of zone electrophoresis and density gradient centrifugation in the purification of some unstable plant viruses. BRAKKE, MYRON K. Concentrates prepared by 1 cycle of differential centrifugation followed by a cycle of density gradient centrifugation were subjected to zone electrophoresis. *Nicotiana rustica* was used as a source of *Aureogenus vastans* with 0.1 M pH 5.6 acetate buffer being used for electrophoresis in potato starch columns. The virus was located after electrophoresis by density gradient centrifugation of eluates of segments of starch columns. The zones obtained by density gradient centrifugation had previously been correlated with infectivity. *Aureogenus magnivena* was obtained from sweet clover stem tumors or viruliferous *Agallia constricta* and electrophoresis carried out by the same technique except that 0.02 M pH 6.0 phosphate buffer was used. There appeared to be a small amount of adsorption of these 2 viruses on the starch but much more adsorption of the normal plant constituents. *Lethum australiense* was obtained from *N. rustica* and electrophoresis carried out in a sucrose density gradient tube containing 0.01 M neutral phosphate buffer. The progress of the electrophoresis in the gradient tube could be followed by observing with the naked eye the light scattered by the particles, making it unnecessary to locate the virus by density gradient centrifugation.

Studies on the effect of Chalara fagacearum on oak wood and its effect on rates of rotting by associated wood-rotting fungi. BRANDT, WILLIAM H. In studies using small blocks of various species of oak, *Chalara* failed to weaken oak under the same conditions which permitted associated wood-rotting fungi to decrease the static-bending strength of the blocks more than 90 per cent, in some cases. Considering this and the fact that other workers have shown slight ability on the part of *Chalara* to utilize cellulose, it would seem that *Chalara* alone cannot damage oak timber. No significant difference at either the 5 per cent or 1 per cent level was found between the average static-bending strengths of groups of oak blocks subjected to an associated wood-rotting fungus alone and groups treated in various ways with *Chalara* or its metabolic products before being subjected to the associated fungus. Although there were a few indications that *Chalara* might enhance the rate of deterioration of oak wood by wood-rotting fungi, this has not as yet been demonstrable in the laboratory. A survey revealed several fungi commonly associated with *Chalara* which inhibited *Chalara* growing on agar.

The relationship of fungi to shell bark of lemon trees. CALAVAN, E. C. *Diaporthe citri, Diplodia natalensis, Botrytis cinerea,* and *Botryosphaeria ribis* in wound inoculations