Repeated experiments have indicated that this reduction in yield is actual rather than something due to chance variation. Green pod yield is not influenced as there is no reduction in the number of pods or the number of ovules per pod. The reduction in seed yield is due to an actual abortion of ovules of the white-seeded segregates.

At one time it was thought that the condition might be aggravated by environmental conditions in New York. Experiments conducted at the Asgrow Research Center at Twin Falls, Idaho, during the summer of 1960 indicated that abortion definitely can occur in that area.

The inheritance of this characteristic has not been completely worked out but certain deductive statements can be made: (1) abortion is not due to white seed in and of itself; (2) abortion is probably conditioned by more than one gene and is probably due to complementary action of a gene or genes for abortion and white seed color; and (3) preliminary experiments suggest that the abortion gene or genes actually come from the colored-seeded recurrent parent.

Work on the abortion problem is continuing.

The Effect of Seed Color on Pod Color in Snap Beans.

John D. Atkin and Walter H. Pierce

During the last few years there has been a shift from colored to white-seeded snap beans for processing. This has necessitated the development of new white-seeded varieties, and it has been rather difficult to obtain white-seeded lines with dark green pod color. There has even been some thought that the basic color gene is necessary for the production of dark green pod color. The fact that some of the Blue Lake varieties combine dark pod color and white seed is ample proof that this is not true. However, a problem does exist in that it is difficult to combine dark green pod color and white seed.

White-seeded lines have been developed at the New York State Agricultural Experiment Station by backcrossing white seed into colored-seeded varieties. Genetically these white-seeded lines are practically identical to the recurrent parents except for seed color. However, when these lines are canned they are slightly lighter green in color than the recurrent parent varieties. It has been observed that this color difference increases with sieve size.

A preliminary experiment was conducted at the Asgrow Research Center at Twin Falls, Idaho, while the senior author was there on sabbatic leave during the summer of 1960. Two samples of Tendercrop and two samples of GB-13 (white-seeded Tendercrop type derived by backcrossing) were canned. In one sample of each variety, seeds were removed by splitting the pods longitudinally before processing and only the pods were canned, but the other sample of each variety was canned with the pods intact.

In the normal samples, Tendercrop pod color was considerably darker than that of GB-13, but in the de-seeded samples the pod color of these two lines was practically identical. Although colored seeds caused the pods to appear darker, the dark color was somewhat dull in appearance. The white-seeded and de-seeded colored samples had a much brighter appearance than the colored-seeded sample.

The above experiment would suggest that colored seeds actually cause the pods to appear darker green in color, but this dark green color is somewhat dull. Removal of the seeds or incorporating white seed into the variety by backcrossing will give a slightly lighter colored but brighter pod. This helps to explain the difficulty encountered in breeding white-seeded beans with dark green processed pod color.

Status of Breeding for Root Rot Resistance

James R. Baggett

The Oregon State College program for resistance to *Fusarium solani* f. *phaseoli* has included crosses of the black Mexican PI 165,435, *P. coccineus* line 2014, and the black-seeded pole bean N-203. Azzam and Frazier (BIC No. 1, p. 9) described inheritance studies involving crosses of Blue Lake x 165,435 and Blue Lake x 2014. Since that time the cross Blue Lake x N-203, also originally made by Azzam, has proven superior as a source of resistance. Materials now under test are from the second backcross of (N-203 x Blue Lake) x Blue Lake or bush beans derived from Blue Lake. Resistance in these lines is inferior to that of N-203, especially in white-seeded bush lines. A new cross of Blue Lake x *P. coccineus* (a selected line from Scarlet Runner) has been made and F_3 families are now ready for testing.

In 1960, lines 58-1345-1, 58-1346-2, and 58-944-1 were obtained from D. H. Wallace of Cornell University (see BIC No. 3, p. 19). These lines show a promising degree of resistance in our testing program. Although each line has been quite variable in disease reaction, many plants appear to be more resistant in some greenhouse tests than N-203. Some lines produced from single plant selections in the field this year are more uniform and are being used in crosses with commercial varieties and with N-203 derivatives. Resistance in the Cornell material does not seem to be strongly associated with seedling vigor because these lines are considerably weaker in this respect than N-203 and most commercial varieties.

While seed dipping with an agar-culture mix has been the primary method of inoculation used in this work, better methods for a quicker and more uniform test have been tried in recent months. We have not succeeded in producing foliage infection by the method suggested by Natti (BIC 2, p. 14) except by spraying the plant with the inoculum mixed with diluted agar, in which case the foliage of N-203 and Blue Lake become necrotic to a similar degree. The use of a standardized infected soil preparation failed entirely, presumably because the concentration of the inoculum was much too low. Dipping germinated seedlings in PDA broth culture before transplanting was not quite as effective as our regular seed inoculation method. Dipping similar seedlings in broth culture mixed with agar produced such severe effects that the N-203 level of resistance could not be differentiated. Although the last method could possibly be used with modifications it is felt that growth variations caused by the transplanting procedure would result in detrimental variability in results. The method of planting seeds on infected oats, as described by Frazier, *et al.* elsewhere in this issue, has given promising results and is being tried extensively.

A controlled soil temperature facility for this work has been satisfactorily developed by lining a greenhouse soil bench with flat sheets of 6 mil. builders plastic, filling with water, and installing plastic heating cables and a thermostat. The cost of this setup for a 32' x 2½' bench, with the bench already available, was about $10 for plastic (two thicknesses), $10 for thermostat, $10