Combined analysis for percent weight loss of three experiments for two days, 1967.

Test	(1) w/stems	(2) w/o stems	(3) broken stems	(4) w/stems rubbed	Test Average
May 29	17.29 b[1/]	16.75 b-c	17.53 b	20.62 a	18.05 a
June 5	11.53 c	11.30 c	11.32 c	16.54 bc	12.67 c
June 12	16.23 c	14.66 d	14.90 c	21.06 a	16.71 b
Comb.	15.01 b	14.25 c	14.58 bc	19.41 a	

1/ Classes of significance.

Combined analysis for percent weight loss of three experiments from two to four days, 1967.

Test	(1) w/stems	(2) w/o stems	(3) broken stems	(4) w/stems rubbed	Test Average
May 29	10.30 c	9.60 cd	8.88 d	12.09 b	10.22 b
June 5	10.20 c	10.26 c	10.46 c	14.51 a	11.36 a
June 12	11.41 b	10.16 c	9.99 c	14.33 a	11.47 a
Comb.	10.64 b	10.01 c	9.78 c	13.64 a	

Combined analysis for percent weight loss of three experiments for four days, 1967.

Test	(1) w/stems	(2) w/o stems	(3) broken stems	(4) w/stems rubbed	Test Average
May 29	35.78 d	24.76 d	24.84 d	30.24 b	26.40 a
June 5	20.58 f	20.41 f	20.63 f	28.66 c	22.57 b
June 12	25.80 d	23.34 e	23.41 e	32.35 e	26.23 a
Comb.	24.05 b	22.84 c	22.96 c	30.42 a	

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Inheritance of Resistance to Halo Blight in OSU Bush Bean Line 10183

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OSU bush green pod, black-seeded, line 10183 (P_2) has been shown to have high resistance to halo blight while OSU white-seeded line 58 (P_1) is highly susceptible. The two lines were hybridized in spring, 1967, in the greenhouse and F_2 and BC_1 seeds secured in the field in the summer. In October, 1967,

the parental, F_1, F_2, BC to P_1, BC to P_2 materials were grown in the greenhouse at Oregon State University.

The plants were inoculated by spraying with a bacterial suspension when the first trifoliate leaf was fully expanded. Three weeks after the first inoculation, plants were inoculated again to insure heavy infection of stems and leaves of susceptible plants. The inoculum, prepared from fresh tissues of bean plants and pods, was known to contain race 2 and most likely additional races of the organism. The following table shows segregation for halo blight resistance and flower color.

Table 1. Segregation for resistance and susceptibility to halo blight and flower color in the cross OSU 58 and OSU 10183.

Pedigree	Susceptible (dead)	Resistant (surviving)	White	Colored	Total No.
P_1	25		25		25
P_2		19		19	19
F_1	1	22		23	23
F_2 (18 crosses)	224	648	193	679	872
BC to P_1	73	33	55	51	106
BC to P_2	3	93		96	96

Plants of OSU 58 (P_1) were all killed at an early date while all plants of OSU 10183 (P_2) were highly resistant, showing only occasional small necrotic spots. Three separate readings for resistance were made; plants were rated on a 0-9 scale, with 0-2 representing early to late death, 3-6 intermediate resistance, and 7-9 high resistance. Data here, however, are reported on the basis of the third reading, when pods were fully mature, and when it was possible to determine with reasonable accuracy those plants killed as a result of systemic infection by the organism and those highly or intermediately resistant. Intermediates were placed in the resistant (surviving) group. The disease reaction was apparently controlled primarily by qualitative genes as indicated by the bimodal distributions in the segregating generations. The resistant reaction was dominant. Modifying genes and environment also affected the expression of the reaction. Many F_2 plants were much slower in dying than plants of the susceptible parent. Also, only a relatively few plants considered resistant (surviving) were as resistant as the resistant parent. Obviously, additional genes are in play-confirmed by behavior of the backcross progeny. Interplay of variation within the bacterium with host plant variation must be recognized. Behavior of the parental material, however, has so far been consistent.

Flower color was studied for possible linkage with halo blight resistance and as a criterion in determining absence or presence of selfs. A good fit to a 3:1 ratio of colored to white plants was obtained in the F_2 and a 1:1 ratio

in the testcross. The results show that a single gene pair governed flower color.

A Chisquare value of 1.914 for independence showed that disease reaction and flower color were independently inherited. Transfer of halo blight resistance to a high pod quality, white-flowered, white-seeded bean out of the 10183 cross appears feasible, yet rigorous testing for resistance, selection for horticultural characters, followed by backcrossing to 58, will be required.

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Inheritance of Dry Pod Color in Snapbeans, (Phaseolus vulgaris)

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Inheritance of dry pod color in Phaseolus vulgaris was studied in reciprocal crosses and selfing of hybrids between green dry pod green seed coat and tan dry pod white seed lines. The results from the F_2 population indicate that tan dry pod color was dominant to green and a ratio of 13:3 obtained suggested that one color factor and an inhibiting factor controlled the segregation of the dry pod color. Ratio for seed coat color was similar to that previously reported; however, in this cross two genes controlled the seed coat color. When the two characters were considered together, a 12:1:3 ratio was obtained. Detailed information will be published in the Journal of Heredity.

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Some Experiences in Testing Beans for Resistance to Halo Blight

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Normally, weather conditions in the Netherlands favour infection and distribution of halo blight in field crops of beans due to cool, rainy and windy periods which often occur during summer time. These conditions forced Dutch bean breeders to select for resistance to halo blight over the past years. In several varieties of dwarf snap beans, like Dubbele Witte (Double White stringless) and Widusa, such a tolerance to Pseudomonas phaseolicola was incorporated so that under field conditions infection of pods and seeds did not occur. Nevertheless, sometimes a very slight attack of the leaves was visible in rows of plants which were directly adjacent rows of very susceptible varieties with halo blight like Processor or Harvester.

The same tolerance proved to be present in Michelite, Red Mexican - and most Great Northern - selections. Also, these varieties have never shown any damage in the field in the Netherlands. Therefore, our results more or less confirm the results of Coyne, Schuster, and Fast (BIC, annual report 1967).