temperatures, it would be desirable to transfer genes determining the low temperature response for early flowering of the Bush Blue Lake derived lines into bush green bean types.

## Breeding for Halo Blight and $BV_2$ Resistance in Snap Beans

M. H. Dickson and J. J. Natti
New York Agr. Experiment Station, Geneva, New York

P.I. 181954, P.I. 150414 and OSU 2065 have previously been shown to have some resistance to halo blight races 1 and 2. In our field trials it is being observed that P.I. 181954 had considerable tolerance to $BV_2$, while P.I. 150414 and OSU 2065 are very susceptible.

P.I. 181954 was crossed to Tendercrop and screened for resistance to halo blight in $F_2$ and $F_3$. Bush $F_4$ resistance plants were back crossed to Tendercrop, and White Seeded Tendercrop for genetic studies and to improve plant type. In addition OSU 2065 and P.I. 150414 were crossed to Tendercrop, or White Seeded Tendercrop. The following table shows the segregation for halo blight and $BV_2$ resistance in the various crosses.

Table 1. Segregation for Resistance to Halo Blight Races 1 and 2 and Yellow bean Mosaic in $F_2$.

| Pedigree | Susceptible | Resistant | Ratio | Virus |
|---|---|---|---|---|
| Tendercrop x H43* | 43 | 15 | 3/1 | Segregating |
| H35 x Tendercrop | 28 | 10 | 3/1 | " |
| Tendercrop x H96-1 | 11 | 3 | 3/1 | Susceptible |
| Tendercrop x H96-2 | 9 | 6 | 9/7 | " |
| Tendercrop x H76 | 58 | 44 | 9/7 | Segregating |
| H75 x Tendercrop | 14 | 11 | 9/7 | " |
| H88 x W.W. Tendercrop | 12 | 10 | 9/7 | Susceptible |
| Tendercrop x OSU 2065 | 147 | 48 | 3/1 | " |
| W.S. Tendercrop x OSU 2065 | 51 | 16 | 3/1 | " |
| Tendercrop x P.I. 150414 | 75** | 17 | 3/1 | " |

* H35, H43, H75, H76, H88 and H96 obtained their resistance from P.I. 181954.

** Some plants were possibly misidentified due to extreme virus susceptibility.

In our trials P.I. 181954 had generally shown better tolerance to halo blight than P.I. 150414 in both field and greenhouse. In 1966 in the field 9:7 and 3:1 ratios of susceptible to resistance plants were observed in the $F_2$ involving the 181954, indicating 1 or 2 recessive genes for resistance. P.I. 150414 and OSU 2065 apparently contain a single gene for resistance. However, since the previous mentioned $F_4$ material involving P.I. 181954 was the source of resistance, it is possible in some cases the second gene was lost. Likewise, some $F_4$ plants must have lost the virus resistance. This was confirmed by both the resistance of the $F_5$ parents to $BV_2$ and the $BCF_2$ segregation for $BV_2$. It will be a help to breeding programs if double resistance can be obtained from ~~150414~~.

## Inheritance of Fish Face Seed Character in Snap Beans

M. H. Dickson
New York Agricultural Experiment Station, Geneva, New York

The seed coat rupture or fish face condition occurs commonly in most snap bean varieties to a varying degree. In New York, Wade, Earligreen, Earliwax, Streamliner, Harvest King, Slendergreen, and Tendercrop had respectively 0.9, 2.8, 0.2, 1.2, 0.3, 0.3 and 4.9% of their seed fish face in 1965 and 1.1, 1.7, 0.2, 3.0, 1.9, 0.9, and 4.2% in 1966. However, when plants are handled on an individual basis in some cases 50-60% of the seed will be fish face.

Crosses of low fish face lives 1.5% with high fish face 35-40% produced an $F_2$ which segregated in a 1:2:1 ratio for high, medium, and low fish face producing plants. Observed populations were 34/70/37, 38/85/51, 15/26/14, 25/48/27, indicating a single incompletely dominant gene for low fish face. However, the mean number of fish face seed of the $F_1$ and $F_2$ was about 10% rather than the parental mean of 20%. There was little difference in per cent fish face produce in greenhouse or field, although the total number of seeds per plant were higher in the field.

Since the fish face character at most has a 50% penetrance selecting on a mass basis for low fish face will have little effect. The only way to reduce the fish face product would be by single plant selection. In all varieties tested, some plants produce no fish face even when producing large seed crops. Therefore, it should be quite simple to produce varieties without this problem or to reselect within varieties for a very low fish face production.

## Effect on Leaf Removal on Yield and Its Components, in Field Beans

Rodrigo A. Duarte[1/]
Centro Nat. Invest. Agriculture, Tulio Ospina,
Medellin, Columbia, S. A.

In order to determine the effect of photosynthetic leaf area on yield

1/ National Sub-Director of Bean and Soybean Improvement Program, Colombian Institute of Agriculture, Colombia, South America.