The bacterial diseases of beans (Phaseolus vulgaris L.), common blight and bacterial wilt, caused by Xanthomonas phaseoli (E. F. Smith) Dawson and Corynebacterium flaccumfaciens (Hedges) Dows., have caused substantial bean yield losses (4). There is no satisfactory chemical control of these bacterial diseases. An objective of our breeding program was to develop an early maturing ‘Great Northern’ (GN) cultivar tolerant to the two bacterial diseases and comparable to the standard GN cultivars. This has been difficult to achieve because of unfavorable linkages, low heritability of the common blight reaction, and the number of genes involved (2). The recently released ‘Great Northern Star’ (‘GN STAR’) combines the desired traits and is described here.

Origin

‘GN STAR’ was derived from the cross of the late flowering lines GN Nebraska #1 sel. 27 (tolerant to common blight) and PI 165078 (tolerant to 3 strains of bacterial wilt — yellow, orange, and purple). The delayed flowering of these late maturing lines was due to a response to long photoperiod — high temp interaction (1) and was controlled by different qualitative genes. Tolerance to bacterial wilt was controlled by major genes (2) while tolerance to common blight was inherited quantitatively (3). GN Nebraska #1 sel. 27 was used as a recurrent parent and 6 backcrosses were made to successfully recombine genes controlling earliness and a high level of tolerance to both pathogens. Linkage between genes controlling tolerance to common blight and delayed flowering was broken.

‘GN STAR’ was named after Son-of-Star, a Hadatsa Indian, who provided Oscar H. Will, Oscar H. Will Company, Bismarck, North Dakota, in 1887, with some ‘Great Northern’ dry bean seed (5). The seed was then advertised and this was the first record of the GN bean in the seed trade.

Description

The seed shape and color of ‘GN STAR’ (tested as GN-CB-BW-71-44) is similar to the standard GN cultivars ‘1140’ and ‘UI #59’, but the seed size is slightly larger (Fig. 1). ‘GN STAR’ matures as early as ‘GN 1140’ (85–90 days) and its plant habit is nearly comparable to ‘GN UI #59’. Nine cultivar trials were conducted in western Nebraska from 1972 to 1975. The yield of ‘GN STAR’ was comparable to the standard cultivars in the absence of bacterial diseases. ‘GN 1140’ and ‘GN UI #59’ died when inoculated with C. flaccumfaciens, while no visual symptoms were noted on ‘GN STAR’. ‘GN STAR’ only showed slight symptoms of common blight on foliage and pods when inoculated with Nebraska isolates of X. phaseoli, while ‘GN 1140’ was highly susceptible and ‘GN UI #59’ was moderately susceptible.

Outstanding characteristics and uses

‘GN STAR’ is the first GN cultivar to combine earliness, suitable seed size and shape, and high tolerance to bacterial wilt and common blight. The cultivar should reduce losses due to bacterial diseases and permit an expansion of the dry bean seed industry in Nebraska.

Availability

Seed of ‘GN STAR’ may be obtained from the Nebraska Foundation Seed Division. Foundation seed was distributed to growers to produce certified seed in Spring 1976.

Literature Cited

virus tolerance.

Description

Immature pods of 'Worthmore' are green and gradually fade to purple as they mature. Mature pods are purple with an average length of 13.4 cm (11/2 inches) with an average of 16 seeds per pod.

In the green shell stage, the peas are light green with a slightly tan eye. Dry seeds are light tan with a greenish tan eye. In general, the plants and pods resemble the 'Pinkeye Purple Hull' and the seeds are very similar to 'Mississippi Silver'. The seed coat is smooth.

Plants are upright with peduncles extending above the foliage. 'Worthmore' produces mature pods in about 63 days when planted in May.

Outstanding Characteristics

'Worthmore' has averaged 5 100 kg/ha for 3 consecutive years over 2 locations and is well adapted for mechanical harvesting and shelling. The color, flavor, and texture is excellent.

No virus symptoms have been observed on 'Worthmore' when grown adjacent to susceptible cultivars expressing massive virus symptoms. Viruses common to southernpeas mechanically introduced to 'Worthmore' and susceptible cultivars included strains of Cowpea Chlorotic Mottle Virus (CCMV), Southern Bean Mosaic Virus, Cucumber Mosaic Virus (CMV) and Cowpea Aphid-borne Mosaic (CAMV). No symptoms were observed after inoculation except with CCMV which produced a mild mottle after 30 days. This ability of 'Worthmore' to tolerate or resist mosaic virus infections is its most valuable asset.

Availability

Breeder seed of 'Worthmore' have been released to the Georgia Crop Improvement Association.

Literature Cited


'Oregon CR-1' Broccoli1

J. R. Baggett
Department of Horticulture, Oregon State University, Corvallis, OR 97331

Additional index words. Brassica oleracea (Italica group), vegetable breeding, clubroot resistance

'Oregon CR-1' is a late maturing cultivar of broccoli, Brassica oleracea (Italica group), resistant to clubroot, Plasmidophora brassicae. Wor. It was released by the Oregon Agricultural Experiment Station for commercial production and as a source of clubroot resistance for plant breeders.

Origin

'Oregon CR-1' was increased and tested as B150 MC. It was derived by intercrossing (using bees in the greenhouse) 22 selections from the 9 best F6 sublines of B150-7-1. Seed was saved from each plant separately, bulked by subline, and tested. Remnant seed from 4 of these lots was combined and increased twice as mass populations. It is thus an open pollinated cultivar with a relatively narrow genetic base. Inbreeding depression is apparently expressed by slow growth which results in a late maturing crop.

In the pedigree (Fig. 1), line F, the original clubroot resistant parent, was selected from a group of accessions received in 1953. It was a leafy annual with small, loose flower heads. The source of this line and its background have been lost. 'Northwest Waltham', the only commercial cultivar in the parentage, was developed in the Northwest from 'Waltham 29'.

Description

Seedling vigor of 'Oregon CR-1' is poor compared to most F1 hybrids or open pollinated cultivars and maturity is about 10 days later than that of early cultivars such as 'Gem'. Ultimate plant and head size are good, with yields often equaling or exceeding commercial controls. Plants typically reach 46–61 cm (18–24 inches) in height with heavy stems. Heads often reach 20–25 cm (8–10 inches) in diameter with trimmed weight of up to 340 g (.75 lb.). The head is usually smooth but can become moderately segmented. Florets are medium small, and usually uniform in size and color. Side-branch production is somewhat limited and late. Fig. 2 shows typical heads harvested in

1 Received for publication August 23, 1976. Technical paper 4343, Oregon Agricultural Experiment Station.