



UNIVERSITY OF IDAHO  
College of Agriculture

# Idelight



A NEW  
SNAP BEAN  
RESISTANT TO  
MOSAIC AND  
CURLY TOP

IDAHO  
AGRICULTURAL  
EXPERIMENT  
STATION

Bulletin No. 442  
MAY 1965

by Leslie L. Dean

# Idelight

## A Curly Top and Mosaic Resistant Snap Bean

Leslie L. Dean

The semi-arid climate in southcentral Idaho is not usually favorable for the survival of the organisms which cause common bacterial blight, halo blight, or anthracnose of beans.<sup>1</sup> Consequently, Idaho is well known for production of high-quality disease-free bean seed. Curly top, a virus-induced disease, has restricted snap bean production in southern Idaho and is the most important factor limiting extension of the contract bean seed acreage into southwestern Idaho.

The curly top virus is transmitted by the beet leafhopper (*Circulifer tenellus* B.). Occasionally beans susceptible to curly top are grown in areas subject to curly top epiphytotic. In spite of some success, losses are sustained both by growers and seed companies. All snap bean varieties presently acceptable to the processing industry are susceptible to curly top. Tolerance to infection with the virus varies among the snap bean varieties. None of those presently important, however, are sufficiently tolerant to escape more than a very moderate curly top epiphytotic. Suitable resistant snap bean varieties could completely eliminate these losses and facilitate an extensive expansion of the garden bean production area of southern Idaho.

The University of Idaho has developed many dry bean varieties resistant to curly top and seed-borne mosaic.<sup>2</sup> These curly top resistant varieties have made the production of dry edible beans both practical and profitable over a considerable portion of the irrigated farmland in southcentral and southwestern Idaho.

In 1954, the University of Idaho released two curly top and mosaic resistant garden bean varieties.<sup>3</sup> Because of lack of adaptation to commercial processing, these did not become important. Continued research has resulted in the development of additional curly top and mosaic resistant snap bean types. Breeder's seed of the variety *Idelight* was released to the seed and processing trade in March 1964. This variety appears to be adapted for commercial freezing and as a home garden bean.

<sup>1</sup> Dean, Leslie L. and Lucien Laferrriere. Diseases of beans in Idaho. Idaho Agr. Expt. Sta. Bull. 293. 1958.

<sup>2</sup> Hungerford, C. W. Disease resistant field beans for Idaho. Idaho Agr. Expt. Sta. Bull. 118. 1952.

<sup>3</sup> Dean, Leslie and C. W. Hungerford. Idaho Bountiful and Golden Gem snap beans resistant to mosaic and curly top. Idaho-Agr. Expt. Sta. Bull. 217. 1954.



**Figure 1**—Idelight produces a sturdy, upright plant with medium green foliage. At the Twin Falls Branch Station the plant has ranged from 15 to 16 inches high with an 18-inch spread.

## PEDIGREE AND DISEASE RESISTANCE

The curly top and mosaic resistant snap bean, *Idelight*, was developed from a cross made at the University of Idaho, Bean Research Laboratory, Twin Falls, Idaho, in 1951. The parents in the cross were J47-4 and Z8T-4. Subsequent selections were made on the University trial grounds located throughout southern Idaho.

The University of Idaho line, J47-4, is resistant to the curly top virus and to both the type (BV1) and the A (BV1A)\* strains of the common bean-mosaic virus. It was derived through successive crosses and selections within crosses involving Full Measure, Red Valentine, Corbett Refugee and Burtner's Blight Proof. Resistance to curly top was obtained from Burtner's Blight Proof and resistance to common bean-mosaic from Corbett Refugee.

\*Also referred to as the New York 15 strain of common bean-mosaic.

The original breeding line, Z8T, resulted from a cross of Z-8 and Tenderpod. It is susceptible to curly top, but is resistant to common bean-mosaic. Z8T was secured in a mutual exchange of breeding stocks between the University of Idaho and the USDA. Curly top and common bean-mosaic resistant snap bean lines developed in the University of Idaho breeding program were supplied to the USDA for inclusion in the federal bean breeding program. The University of Idaho received several good quality curly top susceptible, mosaic resistant snap bean breeding lines in exchange. The line Z8T-4 was selected as a single plant from among this material.

Idelight is resistant to the curly top virus and the seed-borne mosaic virus strains (BV1 and BV1A) presently important to bean producers. Ideight will be of particular benefit to those areas of southern Idaho and the arid western United States where curly top makes the growing of susceptible bean varieties hazardous. Resistance to seed-borne mosaic is of universal importance wherever beans are grown whether for seed or for food.

## PLANT HABIT

Idelight, Figure 1, produces a sturdy and upright plant with medium green foliage. The leaves are slightly smaller than the average garden bean variety and are moderately dense. Plant height at the University of Idaho Twin Falls Branch Station has been from 15 to 16 inches with a spread of 18 inches. At the University's Parma Branch Station the height has ranged from 18 to 22 inches with a spread of approximately 22 inches. Plants are slightly stemmy, but there is little doubt that the pods can be harvested satisfactorily by mechanical pickers.

**Figure 2—Idelight is slim podded with the set concentrated at midheight on the plant. It appears well adapted for mechanical harvest.**



## PODS

Pod set, Figure 2, is concentrated, heavy and situated at mid-height on the plant with an occasional pod touching the ground. The pods at prime stage are round, straight, slender and smooth. Idelight pods are medium dark green with a waxy translucency which imparts a distinctive and very attractive finish.

Table 1—Comparison of yield, pod size and percent of seed and fiber of three snap bean varieties when grown for processing trials<sup>1</sup>.

Variety	Days from planting	Yield of green pods lb./acre	Sieve Size distribution			Percent seed	Percent fiber
			1-3	4	5-6		
			% by weight				4 sieve
Idelight	55	2080	47	46	7		
	58	7045	20	64	16	6.7	.006
	60	8915	15	61	24	8.7	.012
							5 sieve
USDA D-11	53	4890	13	45	42	5.2	.004
	55	6450	11	44	45	8.3	.010
	58	8210	9	20	71	11.3	.008
	60	8610	6	14	80	15.1	.038
							5 sieve
Tendercrop	53	3505	15	60	25	3.7	.008
	55	4415	10	54	36	7.1	.010
	58	8225	11	39	50	9.0	.034
	60	10045	6	29	65	12.5	.090

<sup>1</sup> Hollis, William. 1962. Snap Bean Variety Study. University of Maryland Research Mimeo 23-62. (Second printing.)

Since Idelight is a slim-podded type, a very high percent of the pods at prime processing maturity will be within the 1-to 4-sieve size range, with more than 50 percent grading 4 sieve (Table 1). Probably no more than 25 percent of the pods should grade 5 sieve at harvest for maximum yield of high quality pods. Beyond such limits, tissue degeneration, fiber and percent of seed may become undesirable, as is true when any bean variety becomes over-mature. Four-sieve pods are from 4½ to 5¼ inches long and have a desirable low percentage of fiber and seed. The variety is capable of producing a high yield of 1-to 4-sieve pods of high quality. Pods become slightly to moderately rough with advancing maturity. Length of 5-sieve pods varies from 5 to 5¾ inches. Harvest should be timed to take advantage of the small sieve and the inherent high yield characteristics of this bean.

## QUALITY

Seed development in Idelight is very slow, and the seed-coat pigment is very slow to develop. It produces pods of desirable quality for freezing commercially and the resulting product is an attractive medium dark green color. On canning, however, the seed and suture color is reported to become objectionable to commercial processors. Pigment development in the processed product is

considerably less marked in the smaller sieve pods than in larger pods. Canned samples are a medium green color, and the liquor is colored.

Home gardeners will find Idelight to be a very desirable canning and freezing variety if it is harvested at the optimum peak of quality and not allowed to become over-mature.

## SEED

The number of seed averages 100 per ounce. The seed coat is brown which may limit commercial processing use to freezing.

## SUMMARY

Idelight snap bean is resistant to curly top and seed-borne mosaic viruses. It appears well adapted to commercial freezing, mechanical harvest and production where curly top is a hazard. The plant is erect and sturdy. A high yield of slim, smooth, round, medium dark green pods is produced at midheight. Harvest should be timed to take advantage of the small sieve characteristics and high quality at prime maturity. Idelight is also desirable for home canning and freezing.

NR PO 7680 6M-4-65

**THE AUTHOR:** Leslie L. Dean is Associate Plant Pathologist at the University of Idaho Bean Research Laboratory, Twin Falls, Idaho.

**FURTHER INFORMATION:** Individuals or firms interested in additional data describing habit, yield or processing characteristics of the Idelight bean are invited to contact the author at Twin Falls.