

## Cultivar Selection

Information about dry bean cultivar performance can be accessed on the Web at [www.ag.ndsu.edu/varietytrials](http://www.ag.ndsu.edu/varietytrials), the site with all variety trial data from NDSU Research Extension Centers for all crops. When selecting a high-yielding and good-quality cultivar, use data that summarize several years and locations. Choose a high-quality cultivar that, on average, performs the best at multiple locations near your farm during several years.

## Planting Rates

Pinto bean ranges from 1,200 to 1,500 seeds per pound. Planting rates suggested for pintos are 50 to 65 pounds per acre of pure live seed. Populations of 70,000 plants per acre for pinto beans have been found to be adequate. In some instances, reduced yields were observed when plant populations were below these recommendations. Under irrigation, some lodging has been observed in the Type I cultivars at extremely low plant populations.

Planting rates vary from 35 to 65 pounds per acres, depending on row spacing, bean market class (Table 6) and percent of pure live seed. Navy bean ranges from 2,200 to 2,500 seeds per pound. Planting rates suggested for navy beans are 35 to 45 pounds per acres of pure live seed.

**Table 6. Seeds per pound for different dry bean classes.**

<b>Market Class</b>	<b>Seeds per Pound</b>
Kidney	800 - 1,000
Pinto	1,200 - 1,400
Great Northern	1,400 - 1,800
Pink/Small Red	1,600 - 2,000
Navy/Black	2,400 - 3,000

**Table 7. Planting guide for navy and pinto bean.**

<b>Approximate Lbs. Live Seed Per Acre</b>	<b>Plants Per Acre</b>	<b>Row Width</b>			
		<b>Seed Spacing Within Crop Row</b>			
		<b>6"</b>	<b>12"</b>	<b>22"</b>	<b>30"</b>
<b>Pinto Bean</b>		<b>inches</b>			
50	62,500	–	8.4	4.6	3.4
60	75,000	–	7.0	3.8	2.8
70	87,500	–	6.3	3.3	2.5
80	100,000	–	5.2	2.9	2.1
<b>Navy Bean</b>		<b>inches</b>			
30	75,000	–	–	3.8	2.8
40	100,000	–	5.2	2.9	2.1
50	125,000	8.4	4.2	2.3	1.7
60	150,000	7.0	3.5	1.9	1.4
70	175,000	6.1	3.0	1.7	–
80	200,000	5.2	2.6	1.5	–

Studies conducted at various plant populations do not indicate any significant advantage to having populations greater than 90,000 plants per acre for Type I navy beans. Similarly, recent studies have shown that planting upright cultivars (Type II) at intermediate row spacings (18 to 22 inches) allows for a significant increase in yield. Slightly higher seeding rates are advised under irrigation. Table 7 provides a planting guide for pinto and navy bean.

Rates should be adjusted for low-germination or cool, wet planting conditions. To obtain desired plant populations, overseed live seed by 10 to 15 percent to compensate for losses during emergence. The normal planting depth is 1½ to 2½ inches. Seed should not be planted deeper unless the topsoil is dry. Plant seeds in moist soil if possible. Growers should test their planter on a hard surface and in the field at normal planting speeds to ensure proper depth and seeding rate.

## **Row Spacing**

Dry bean cultivars commonly are grown in 30-inch rows, but the trend is for production in narrower rows. Studies at NDSU indicate narrower planted rows provide a yield advantage in dryland and irrigated production (Table 8).

Growing dry bean in narrow rows poses several potential problems. The more closed canopy increases the potential for diseases. Narrow rows do not allow between-row cultivation. Also, challenges

increase with direct harvest of narrow rows, including increased potential for seed loss.

**Table 8. Pinto bean yield for four plant population averaged across several North Dakota locations.**

Row spacing in inches	Irrigated		Dryland	
	4-station year avg. lb/A	% yield of 30-inch row	5-station year avg. lb/A	% yield of 30-inch row
10	4,238	124	1,752	122
20	3,677	108	1,514	106
30	3,418	100	1,431	100
40	3,423	100	1,347	94

## Growing Requirements

Dry bean is adapted to a wide variety of soils. It is not sensitive to soil type as long as the soil is reasonably fertile, well-drained and free of conditions that interfere with germination and plant emergence, such as salinity. The majority of dry bean acres are conventionally tilled; however, dry bean can be grown successfully in conservation tillage systems. For example, five site-years of research at Carrington indicate similar seed yield with strip tillage (2,590 pounds/acre) compared to yield with conventional tillage (2,620 pounds/acre).

Dry bean is a warm-season crop and usually is not affected by high temperature if adequate soil moisture is present. Cool, humid or rainy weather

is unfavorable to dry bean, but it is adapted to a fairly wide range of temperature. The optimum average growing temperature for dry bean is 65 to 75 F.

Dry bean production is more successful in areas where rainfall is light during the latter part of the growing season. Growing the crop on a well-drained soil is essential because beans are extremely sensitive to standing water or waterlogged conditions. Tile drainage will reduce saturated conditions in the root zone, which will improve plant development. Dry bean is not tolerant to frost or prolonged exposure to near-freezing temperatures at any stage of plant growth.

## **Hail Damage**

The amount of crop damage caused by hail will depend on the intensity, size of hail stones and duration, as well as plant type and stage of development. Determinate (Type I) cultivars are likely to suffer greater losses than the indeterminate (Types II and III) cultivars because Types II and III can recover and compensate to a greater degree than can Type I.

Severe hail damage can delay plant maturity. The earlier the stage of development at which the injury occurs, the greater the time available for recovery, resulting in less yield reduction. Hail will not directly affect seed quality unless a strike occurs on the pod.