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UNIVERSITY OF IDAHO  
College of Agriculture

# Pinto UJ-114



**A NEW  
PINTO BEAN  
RESISTANT TO  
MOSAIC AND  
CURLY TOP**

**IDAHO  
AGRICULTURAL  
EXPERIMENT  
STATION**

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# Pinto UI-114

## A Pinto Bean Variety Resistant to Curly Top and Common Bean-Mosaic

Pinto bean acreage now exceeds that of any other dry edible bean grown in Idaho. In the United States only Pea or Navy bean production is greater than Pinto. However, before Pinto UI-111\* was introduced by the University of Idaho in 1944, production of Pinto beans in Idaho was restricted by the virus diseases, curly top and common bean-mosaic. The original common Pinto varieties were severely affected by both of these viruses and yields were frequently low.

Pinto UI-111 was bred for resistance to the curly top virus and immunity to the type strain of common bean-mosaic virus. Just before the variety was released, a second strain of seed-borne common bean-mosaic, the A or New York 15 strain, was discovered in Idaho bean crops. Pinto UI-111 was susceptible to this strain.

Susceptibility of Pinto UI-111 to the A strain of common bean-mosaic virus has occasionally resulted in some economic loss. It also has complicated the problem of maintaining virus-free seed of the variety. Despite this, Pinto UI-111 has dominated Pinto bean production, not only in Idaho, but in North America.

Pinto UI-114 was developed and released by the University of Idaho Agricultural Experiment Station to provide additional disease resistance in a variety well adapted to the bean growing area of southern Idaho, and to other bean producing areas of the Western United States. The variety was developed by the senior author through pure line breeding. Yield and reaction to fusarium root rot in Idaho were evaluated in cooperation with the co-authors.

### PEDIGREE

Pinto UI-114 was selected from the progeny of crosses made in 1954 between Great Northern J-378 and Pinto UI-111. Great Northern J-378, a non-released line developed at the University of Idaho Bean Research Laboratory, is resistant to the curly top virus and both the type and A strains of common bean-mosaic virus. Progeny of this cross were carried through 6 generations of single plant selection prior to yield evaluations.

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\*UI distinguishes University of Idaho dry bean introductions.

## DESCRIPTION

Pinto UI-114 may be closely compared with UI-111. The vine (Fig. 1) produces slightly longer runners, but the central stem structure is more erect and tends to support the pods somewhat higher above the soil surface than Pinto UI-111. Pinto UI-114 seed (Fig. 2) adheres closely to the traditional color, shape and size so characteristic of Pinto. Pinto UI-114 averages 75 seeds per ounce compared to 88 for UI-111.

## DISEASE RESISTANCE

Pinto UI-114 is resistant to the curly top virus and is immune to the type and A strains of common bean-mosaic virus. Comparative root rot indices indicate that the roots and hypocotyl of Pinto UI-114 are as severely damaged by *Fusarium solani* (Mart.) Appel & Wr. f. *phaseoli* (Burk.) Synd. & Hans. as are those of Pinto UI-111. The root system of Pinto UI-114 is more extensive, however, than that of UI-111. Pinto UI-114 has shown good yield potential in soils infested with this soil-borne pathogen which causes root rot.

## YIELD AND MATURITY

In replicated trials at the Twin Falls Branch Experiment Station from 1960 through 1965, Pinto UI-114 averaged 238 pounds per acre more than UI-111 (Table 1) although the yield difference

Fig. 1. Pinto UI-114 plants are somewhat more erect than Pinto UI-111 and tend to bear pods higher above the soil surface. Pinto UI-114 plants also produce slightly longer runners than Pinto UI-111.



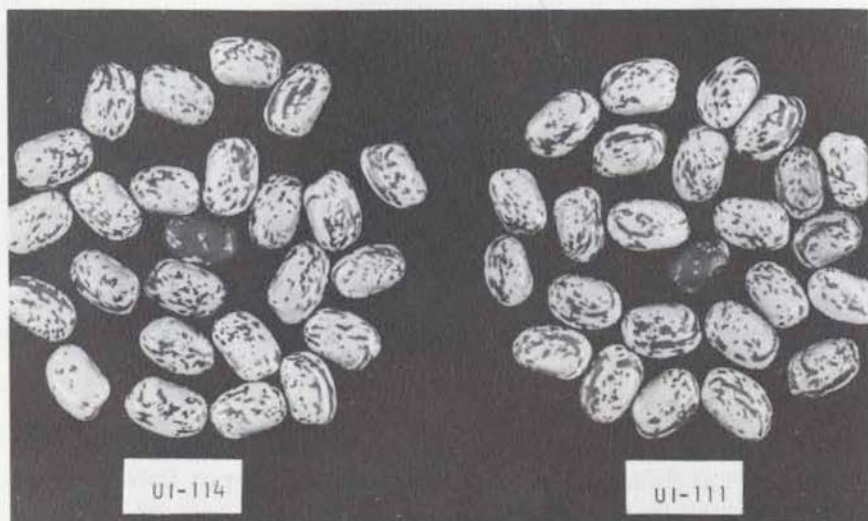


Fig. 2. Seed of Pinto UI-114 adheres closely to the traditional size, shape and color which characterize Pinto. Pinto UI-114 seed is shown on the left and Pinto UI-111 on the right.

in any given year was not statistically significant. The mean yield of Pinto UI-114 at the Twin Falls Branch Station in these years was 3,140 pounds per acre.

Average maturity (Table 1) at Twin Falls from 1960 through 1965 was 95 days for Pinto UI-114 and 93 days for UI-111. Pinto UI-114 matured in 87 days from seeding in 1961 but required 102 days in 1963. Maturity of Pinto UI-111 ranged from 84 to 101 days in the same period.

In 3 years at 6 cooperating experiment stations (Table 2) Pinto UI-114 exceeded the yield of UI-111 in 13 of 18 comparisons. The mean per acre yield advantage was 243 pounds. The mean per acre yield of Pinto UI-114 at these 6 locations was 2,992 pounds.

Table 1. Mean yields per acre and maturity of Pinto UI-111 and Pinto UI-114 at the University of Idaho Twin Falls Branch Experiment Station, Kimberly, Idaho, 1960 through 1965.

Pinto Variety	1960	1961	1962	1963	1964	1965	Mean
<b>Mean yield (lb.)</b>							
UI-111	2230	2960	2714	3090	3400	3020	2902
UI-114	2510	3300	2932	3510	3400	3190	3140
<b>Maturity (days)</b>							
UI-111	97	84	93	101	95	89	93
UI-114	100	87	92	102	97	91	95

**Table 2. Mean yields per acre of Pinto UI-111 and Pinto UI-114 at 6 cooperating experiment stations 1963 through 1965.**

Year	Pinto Variety	Kimberly, Idaho	Tribune, Kansas	Sidney, Mont.	Scotts-bluff Nebr.	Prosser, Wash.	Powell, Wyo.	Mean All Stations	
		lb.	lb.	lb.	lb.	lb.	lb.	lb.	
1963	UI-111	3090	3190	2365	1932	1752	3198	2587	
	UI-114	3510	3930	2773	1890	2045	3178	2887	
1964	UI-111	3400	2410	1217	1935	3213	2803	2496	
	UI-114	3400	2660	1292	2273	3959	3397	2830	
1965	UI-111	3020	3324	3462	2844	3098	3237	3164	
	UI-114	3190	3513	3104	2760	3552	3433	3259	
		Mean 6 stations for 3 years					UI-111	2749	
							UI-114	2992	

Maturity of Pinto UI-114 at 6 locations from 1963 through 1965 (Table 3) ranged from 80 days at Prosser, Wash., to as long as 114 days at Sidney, Mont., in 1963 and 112 days at Powell, Wyo., in 1964. Average maturity at these 6 locations was 94 days for Pinto UI-111 and 100 days for UI-114. It should be noted, however, that at Twin Falls the difference in maturity between the two varieties in any year did not exceed 3 days.

## ADAPTATION

Pinto UI-114 has been compared with several experimental Pinto lines entered in the Western Dry Bean Nursery and with Pinto UI-111. In 1963 yield results were reported from 9 cooperating experiment stations. Pinto UI-114 was the highest yielding Pinto variety at 4 of the 9 stations, and the second highest at 2 other locations. These data indicate that Pinto UI-114 is as widely adapted as Pinto UI-111 which has proved over more than 20 years to be well suited for production over a wide range of climatic situations.

**Table 3. Maturity of Pinto UI-111 and Pinto UI-114 at 6 cooperating experiment stations 1963 through 1965.**

Year	Pinto Variety	Kimberly, Idaho	Tribune, Kansas	Sidney, Mont.	Scotts-bluff Nebr.	Prosser, Wash.	Powell, Wyo.	Mean All Stations	
		days	days	days	days	days	days	days	
1963	UI-111	101	88	98	87	80	102	93	
	UI-114	102	97	114	104	80	109	101	
1964	UI-111	95	93	---	96	90	102	95	
	UI-114	97	100	---	102	95	112	101	
1965	UI-111	89	80	109	87	90	91	93	
	UI-114	91	92	112	95	95	96	97	
		Mean 6 stations for 3 years					UI-111	94	
							UI-114	100	

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