

Growth and Development of Dry Bean and Yellow Pea in Manitoba



University
of Manitoba

MANITOBA
Pulse & Soybean
GROWERS

Ishan Samaranayake, Brodie Erb and Kristen P. MacMillan
Soybean and Pulse Agronomy Research Lab @kpmacmillanUM
Department of Plant Science, University of Manitoba



Overview

- First characterization of dry bean and yellow pea phenology in Manitoba.
- In dry bean, a new node is developed every 3-4 days from VC through to R1. Navy bean generally reaches reproductive stages 2-6 days after pinto bean. At R1, pinto bean has 7-10 nodes and navy bean has 5-10 nodes.
- In pea, two key developmental stages that coincide with scouting and management decisions are V4-5 (herbicide) and R2 (fungicide). On average, these stages occur 26 and 50 days after seeding, respectively.
- The average and range of days after seeding is presented since cultivar, environment and agronomic practices can affect phenology.

Data Collection

- From the control plots of our applied dry bean and pea agronomy studies, the growth stage of dry beans and yellow peas was recorded every 3-7 days beginning at emergence.
- Data was collected from 6 site-years for dry beans (Carman and Melita 2020-2022) and 11 site-years for peas (Carman and Arborg 2018-2022)
- Varieties sometimes varied by site-year. The pinto bean variety was Windbreaker (2020) or Vibrant (2021 and 2022) and the navy bean variety was T9905. These dry bean varieties are upright vines, indeterminate. Yellow pea varieties were AAC Carver, CDC Amarillo and AAC Chrome.
- The average days and accumulated growing degree days (GDD) from seeding are the average of at least 3 site-years (not all growth stages were captured in each site-year).

Acknowledgements

Core funding for the soybean and pulse agronomy research program is provided by Manitoba soybean, dry bean and pea farmers through the Manitoba Pulse & Soybean Growers.

DRY BEAN (*Phaseolus vulgaris*)



		VC	V2-3	V4-5	V8	R1	R2	R3	R4	R5	R6	R7	R8	R9
		Unifoliate	Unrolled trifoliate leaves			Beginning bloom	Beginning pod	50% bloom	Full pod	Beginning seed	50% seed	Full seed	Beginning maturity	Full maturity
Pinto bean	Days after seeding	14 (10-17)	25 (17-31)	32 (24-35)	43 (38-49)	47 (42-50)	51 (47-55)	55 (51-59)	61 (55-66)	63 (56-70)	69 (62-73)	77 (70-86)	80 (77-83)	89 (84-97)
	GDD	177	336	419	547	651	739	809	861	920	940	1079	1151	1265
Navy bean	Days after seeding	14 (10-17)	24 (19-28)	33 (28-35)	45 (42-49)	52 (45-56)	55 (47-62)	61 (55-66)	63 (56-70)	65 (59-73)	75 (69-78)	76 (70-83)	83 (77-90)	93 (85-104)
	GDD	177	306	429	615	718	825	862	920	928	1056	1094	1209	1337

YELLOW PEA (*Pisum sativum* L.)



	V2-3	V4-5	V8	R1	R2	R3	R4	R5	R6	R7	Harvest
	Node development			Flower bud	Beginning bloom	Flat pod	Full pod	Beginning maturity	Mid maturity	Full maturity	
Days after seeding (range)	20 (17-21)	26 (20-34)	37 (27-46)	43 (39-46)	50 (41-56)	55 (48-64)	67 (61-72)	71 (62-77)	80 (73-90)	86 (78-97)	99 (86-133)
Accumulated growing degree days from seeding	214	274	405	543	629	692	856	930	1052	1133	

For complete descriptions of growth stages, refer to the Manitoba Pulse & Soybean Growers "Dry bean growth staging guide" and the "Field pea growth staging guide", available at www.manitobapulse.ca. Growing degree day data accessed from Manitoba Agriculture weather stations (<https://web43.gov.mb.ca/climate/DailyReport.aspx>) and plant development illustrations created with BioRender.com