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Seed Yield and Yield Attributes of Lablab (*Lablab purpureus* L. Sweet) as Influenced by Phosphorus Application, Cutting Height and Age of Cutting in a Semi-Arid Environment

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ABSTRACT

Scarcity of seeds of forage legumes has continued to plague the pasture industry in Nigeria and there is a serious need to tackle this challenge, hence this study was initiated. The experiment entailed field trials that were conducted to evaluate the response of seed yield and yield attributes of lablab (*Lablab purpureus* L. Sweet) to phosphorus application and cutting treatments. The treatments were composed of factorial combinations of four rates of phosphorus application (0, 12, 24 and 36 kg P ha^{-1}), two cutting heights (10 and 20 cm) as the main plot and four cutting ages (6, 12, 18 weeks and at maturity) as the sub-plot a split plot design with three replications. Cutting lablab at 6 weeks or at maturity produced 44.7 and 63.0% higher seed yield than cutting at 12 weeks. Cutting at 20 cm height produced 23.8% heavier seeds than cutting at 10 cm in 2007. Most seeds per pod, heaviest and longest pods were obtained when lablab was cut at either 12 weeks or at maturity. Phosphorus application rate of 12 kg P ha^{-1} increased 100-seed weight (4%) while cutting lablab to a 20 cm height rather than to 10 cm stubble height produced significantly higher 100-seed weight. The heaviest 100-seed weight was produced with a combination of 12 kg P ha^{-1} application rate and a 20 cm cutting height. Lablab could be developed as a ley pasture crop in the Nigerian farming systems to enhance its usefulness to livestock.

Key words: Cutting treatments, stubble height, forage legume, phosphorus nutrition, Nigeria, yield components

INTRODUCTION

The problem of insufficient supply and poor quality of fodder for livestock production in sub-Saharan Africa is partly responsible for the food insecurity prevalent in Africa (Odion *et al*., 2007).

The use of introduced forage legumes is a viable means of correcting the livestock feed constraint. Suitable legume species have the potential to alleviate feed constraints, especially for cattle and other ruminants, during the dry season. However, the non-availability of seeds of the crop in quantities that can be considered adequate is a great challenge. Inadequate seed supply is therefore, likely to hinder the widespread adoption of lablab forage in the livestock sector (Kitalyi *et al*., 2008).

Among the many introduced forage legumes evaluated in Nigeria, lablab *(Lablab purpureus)* has been reported to be a promising crop for the northern Guinea savanna (Iwuafor and Odunze, 1999; Ewansiha *et al*., 2007).

However, many factors affect the adoption of planted forage legumes. Pasture seed production is accorded low priority in Nigeria. Forage seed production is mostly limited to government farms and research institutes. Consequently, utilization of both selected and adapted species is usually constrained by lack of seed (Adeoye and Onifade, 2000).

Carsky *et al*. (2001) suggested that merely introducing improved legume fallows alone without giving consideration to limiting phosphorus is not adequate. Phosphorus application was said to have increased both hay yield and proportion of legumes within the botanical composition of legumes in Turkey (Hatipoglu *et al*., 2001). They observed tangible increase in hay production in the range of 2.95 to 5.51 tonnes per ha after 100 kg P_2O_5 has been applied.

Many of the introduced forage lablab accessions have not been subjected to adequate agronomic management evaluations. Except for studies published by Hena *et al*. (1990) and Lamidi *et al*. (1997) on Rongai and Highworth varieties, respectively, research information on the effect of cutting on any lablab accession as fodder material and source of seed is lacking.

It is rather unfortunate that very little attention is given to the supply of quality pasture seeds in the farming systems and as such, this has become an aspect that is worrisome to stakeholders. Except appropriate steps are taken towards putting in place reliable sources of seed supply, the establishment and development of pastures will be at risk. Pasture seeds occupy the lowest priority in the consideration and agenda of registered seed companies. This is particularly significant if livestock owners choose to establish their own legume pastures for livestock feeding and at the same time source their seeds from such pastures without having to go elsewhere for seed supply (Sule, 2009).

It is therefore, important to further evaluate lablab accession ILRI 147 to ascertain if cutting will affect its ability to produce seeds, which is important for re-establishment of subsequent crops, information that is currently unknown. The main objective of this study was therefore, to evaluate the effect of rates of phosphorus application, cutting height and cutting age on the seed yield and yield related characters of lablab.

MATERIALS AND METHODS

Field trials were conducted in the 2006, 2007 and 2008 cropping seasons at the Institute for Agricultural Research (IAR) experimental farm, Ahmadu Bello University, Samaru (lat. 11°11' N, long. 7° 38' E, 686 m above sea level) in the northern Guinea savanna zone of Nigeria.

Treatments and experimental design: The treatments were factorial combinations of four rates of phosphorus application (0, 12, 24 and 36 kg P ha^{-1}) and two cutting height (10 and 20 cm above ground level) and four cutting ages (6, 12, 18 Weeks after sowing (WAS) and at maturity). The experiment was a split plot design where phosphorus application×cutting height represented the main plot while cutting age was the subplot. The treatments were replicated three times.

Planting and cultural practices: The lablab accession ILRI 147, which is also known as Highworth, black-seeded, was obtained from the International Livestock Research Institute (ILRI-Nigeria) and was evaluated in the study. A row spacing of 30×30 cm and seed rate of

24 kg ha^{-1} which are recommended for fodder production (A.C. Odunze, personal communication, 2006) were used in the experiment. The gross plot size was 5×3 m (15 m^2).

Measurements: A factor of pod weight to pod number was established using 25 samples. With that factor, the pod number of each plot was determined from the pod weight of the plot. Finally, the number of plants harvested per plot was used to divide the pod number to obtain number of pods per plant. Twenty randomly selected pods were obtained from each plot and then weighed with a Mettler top loading electronic balance to determine the average pod weight. Each of the 20 randomly selected pods was measured with a ruler to determine the pod length. After obtaining values for both pod weight and pod length, the 20 randomly selected pods were threshed and the seeds contained there-in were counted and the mean recorded. After threshing, 100 seeds were picked at random from each plot and weighed with a Mettler top-loading electronic balance. This process was repeated to obtain the mean of two samples that was recorded as 100-seed weight.

All the pods from plants within a plot were harvested at maturity, air- dried and later threshed to determine the seed yield per hectare by using a conversion factor.

Statistical analysis: The data collected were subjected to one-way analysis of variance using the SAS software (SAS Institute, 2001) to determine the significance of treatment effects at the 5% level of probability as described by Snedecor and Cochran (1967). The means were separated using the Duncan's Multiple Range Test (DMRT) (Steel *et al*., 1997).

RESULTS

Seed yield: Phosphorus application and cutting height did not cause significant differences in seed yield of lablab whether in each of the years of study or in the combined data.

Cutting age, on the other hand, exerted significant differences in seed yield in all years and in the combined analysis. Lablab that was cut at 18 weeks did not produce viable seeds, in all the three years of experimentation. In 2006 and 2007 seed yields of lablab cut at 6 and 12 weeks and at maturity were at par. However, in 2008 cutting lablab at maturity produced 1654 kg ha^{-1} higher seed yield than cutting at 6 weeks which produced 1158 kg ha^{-1}. Furthermore, cutting lablab at 6 weeks also resulted in a significantly higher seed yield than cutting at 12 weeks. When the data were combined, it was evident that lablab seed yields when cutting was done at 6 weeks and at maturity were 822 and 926 kg ha^{-1}, respectively and this parity was in turn significantly higher than the seed yield of 568 kg ha^{-1} for lablab that was cut at the 12 weeks of age (Table 1).

Number of pods per plant: Phosphorus application and cutting height did not influence number of pods per plant in either year or in the combined analysis (Table 2).

The effect of cutting age however, was significant. The highest number of pods per plant was produced by cutting at 12 weeks (49.8) in 2007 and by cutting at maturity (44.4) in 2008 in both years and in the combined data. Number of pods per plant at different cutting ages varied significantly between the two years. Plants cut at 18 weeks of age failed to produce pods in both years. In 2007, cutting at 12 weeks age of cut produced significantly more pods per plant than cutting at 6 weeks while in 2008, plants cut at maturity produced the most pods per plant followed by those cut at 6 weeks and then those cut at 12 weeks. Cutting at 12 weeks produced the fewest pods per plant that year. However, when the data were combined for both years, plots cut at maturity had significantly more pods per plant than those cut at 6 weeks.

Table 1: Effect of phosphorus application, cutting height and cutting age on seed yield (kg ha^{-1}) in lablab in the 2006-2008 wet and combined data Samaru, Nigeria

Treatment	2006	2007	2008	Combined
Phosphorus (kg P ha^{-1})				
0	701	283	874	619
12	724	349	930	668
24	657	338	782	592
36	746	333	785	621
SE±	76.0	41.5	75.1	38.5
Cutting height (cm)				
10	727	332	742	600
20	686	319	944	650
SE±	53.7	29.3	53.1	27.5
Cutting age (WAS)				
6	821^{a}	4872^{a}	11158^{b}	822^{a}
12	746^{ab}	405^{a}	552.1^{c}	568^{b}
18	--	--	--	--
Maturity	718^{ab}	406^{a}	1654.1^{a}	926^{a}
SE±	76.0	41.5	75.078	38.4

Mean within a column of any set of treatments followed by different letters are significantly different at 5% level of probability according to the Duncan's Multiple Range Test (DMRT) (Steel *et al*., 1997). WAS: Weeks after sowing

Table 2: Effect of phosphorus application, cutting height and cutting age on number of pods per plant in lablab in the 2007 and 2008 wet seasons and combined data at Samaru, Nigeria

Treatment	2007	2008	Combined
Phosphorus (kg P ha^{-1})			
0	26.9	28.0	27.5
12	29.8	29.0	29.4
24	40.7	23.3	32.0
36	23.4	24.1	23.7
SE±	05.80	02.23	03.10
Cutting height (cm)			
10	32.0	24.3	28.2
20	28.4	27.9	28.1
SE±	04.10	01.58	02.20
Cutting age (WAS)			
6	30.9b	34.2^{b}	32.6^{b}
12	49.8^{a}	24.8^{c}	37.3^{ab}
18	--	--	--
Maturity	39.1^{ab}	44.4^{a}	41.7^{a}
SE±	05.80	02.23	03.10

Mean within a column of any set of treatments followed by different letters are significantly different at 5% level of probability according to the Duncan's multiple range test (DMRT), WAS: Weeks after sowing

Pod weight: Phosphorus application and cutting height did not influence average pod weight significantly in all the years of study.

Pod weight responded to cutting age only modestly in 2007, 2008 and in the combined analysis with cutting at maturity producing relatively higher pod weight of 1.7 g compared to 1.6 g for 6 and 12 weeks and 1.0 g for 18 week cutting ages (Table 3). Generally, the pod weight of lablab was

Table 3: Effect of phosphorus application, cutting height and cutting age on mean pod weight (g) in lablab in the 2006-2008 wet seasons and combined data at Samaru, Nigeria

Treatment	2006	2007	2008	Combined
Phosphorus (kg P ha^{-1})				
0	1.1	1.6	1.6	1.5
12	1.1	1.6	1.6	1.5
24	1.1	1.7	1.7	1.5
36	1.1	1.6	1.6	1.5
SE±	0.03	0.03	0.03	0.02
Cutting height (cm)				
10	1.1	1.6	1.7	1.5
20	1.1	1.6	1.7	1.5
SE±	0.02	0.02	0.02	0.01
Cutting age (WAS)				
6	1.1	1.9^{b}	1.8^{b}	1.6^{b}
12	1.1	1.7^{c}	1.9^{ab}	1.6^{b}
18	1.1	1.0^{d}	1.0^{c}	1.0^{c}
Maturity	1.1	2.0^{a}	1.9^{a}	1.7^{a}
SE±	0.03	0.03	0.03	0.02

Mean within a column of any set of treatments followed by different letters are significantly different at 5% level of probability according to the Duncan's multiple range test (DMRT), WAS: Weeks after sowing

Table 4: Effect of phosphorus application, cutting height and cutting age on mean pod length (cm) in lablab in the 2006-2008 wet seasons and combined data at Samaru, Nigeria

Treatment	2006	2007	2008	Combined
Phosphorus (kg P ha^{-1})				
0	4.5	4.4	4.2^{ab}	4.4
12	4.6	4.4	4.3^{a}	4.4
24	4.5	4.4	4.1^{b}	4.4
36	4.5	4.4	4.1^{b}	4.3
SE±	0.04	0.04	0.05	0.02
Cutting height (cm)				
10	4.5	4.4	4.1^{b}	4.4
20	4.5	4.4	4.2^{a}	4.4
SE±	0.03	0.03	0.03	0.02
Cutting age (WAS)				
6	4.5	5.5^{ab}	5.2^{a}	5.1^{a}
12	4.6	5.4^{b}	5.3^{a}	5.1^{a}
18	4.5	1.0^{c}	1.0^{b}	2.2^{b}
Maturity	4.5	5.6^{a}	5.3^{a}	5.2^{a}
SE±	0.04	0.04	0.05	0.02

Mean within a column of any set of treatments followed by different letters are significantly different at 5% level of probability according to the Duncan's multiple range test (DMRT), WAS: Weeks after sowing

heaviest when lablab was cut at maturity but lightest when cutting was done at 18 weeks. The pods from plots cut at 6 weeks were significantly heavier than those cut at 12 weeks in 2007 but in 2008 and in the combined data, pods from plots cut at these two growth stages (i.e. 6 and 12 weeks) were at par.

Pod length: Phosphorus application and cutting height affected pod length in 2008 only, when the pod length of lablab given 12 kg P ha^{-1} application was significantly longer than those obtained when 24 and 36 kg P ha^{-1} rates of phosphorus were applied. Lablab plants that were cut at a 20 cm height in 2008 produced significantly longer pods than those cut at 10 cm. Different cutting heights produced the same pod lengths in 2006, 2007 and the combined data. Also phosphorus rates gave the same pod length in 2007 (Table 4).

The differences in pod length due to cutting age were significant in 2007, 2008 and in the combined for the three years. Plants cut at 18 weeks produced the shortest pods (by 56.9% in the combined data), compared to those cut at the other plant ages, which had produced pods that were similar in length. Pods from plants cut at maturity were consistently the longest in 2007 and the combined data.

Number of seeds per pod: Table 5 shows data on the effects of phosphorus application, cutting height and cutting age on number of seeds per pod of lablab in 2006-2008 and the combined for the three years. Phosphorus application and cutting height did not affect number of seeds per pod significantly in any of the three years.

The differences in number of seeds per pod of lablab due to cutting age were not significant in 2006, whereas in 2007, 2008 and in the combined data the differences were significant green pods and therefore, no viable seeds were produced. The consistent trend showed that cutting lablab at 6 weeks produced significantly fewer seeds per pod compared to cutting later, at 12 weeks and maturity, which had similar numbers of seeds per pod. Across the years and in the combined analysis, cutting lablab at 18 weeks resulted in immature pods.

Seed size: Phosphorus application caused significant differences in 100-seed weight of lablab in 2007 and in the combined data but not in 2006 and 2008. Consistently, plots which received

Table 5: Effect of phosphorus application, cutting height and cutting age on number of seeds per pod in lablab in the 2006-2008 cropping seasons and combined data at Samaru, Nigeria

Treatment	2006	2007	2008	Combined
Phosphorus (kg P ha^{-1})				
0	3.2	3.1	3.2	3.2
12	3.2	3.3	3.1	3.2
24	3.0	3.2	3.2	3.1
36	3.0	3.2	3.1	3.1
SE±	0.09	0.07	0.06	0.04
Cutting height (cm)				
10	3.1	3.2	3.1	3.2
20	3.1	3.1	3.2	3.1
SE±	0.06	0.05	0.05	0.03
Cutting age (WAS)				
6	3.0	33.7[b]	3.7[b]	3.5[b]
12	3.1	4.0[a]	4.0[a]	3.7[a]
18	--	--	--	--
Maturity	3.3	4.0[a]	4.0[a]	3.7[a]
SE±	0.09	0.07	0.06	0.04

Mean within a column of any set of treatments followed by different letters are significantly different at 5% level of probability according to the Duncan's multiple range test (DMRT), WAS: Weeks after sowing

Table 6: Effect of phosphorus application, cutting height and cutting age on 100-seed weight (g) in lablab in the 2006-2008 wet seasons and combined data at Samaru, Nigeria

Treatment	2006	2007	2008	Combined
Phosphorus (kg P ha^{-1})				
0	23	17.3^{b}	17.8	19.3^{b}
12	22.8	20.0^{a}	17.8	20.0a
24	22.7	19.2^{a}	17.8	19.9^{a}
36	22.8	19.2^{a}	18.2	20.0^{a}
SE±	0.15	0.32	0.24	0.15
Cutting height (cm)				
10	22.8	16.8^{b}	17.8	19.1^{b}
20	22.8	20.8^{a}	17.9	20.5^{a}
SE±	0.11	0.23	0.17	0.1
Cutting age (WAS)				
6	23.0^{a}	23.7^{a}	23.7^{a}	23.5^{a}
12	22.7^{ab}	18.5^{b}	22.7^{b}	21.3^{b}
18	--	--	--	--
Maturity	22.4^{b}	24.0^{a}	24.0^{a}	23.5^{a}
SE±	0.15	0.32	0.24	0.15

Mean within a column of any set of treatments followed by different letters are significantly different at 5% level of probability according to the Duncan's multiple range test (DMRT), WAS: Weeks after sowing

Table 7: Interaction between phosphorus rate and cutting height on 100-seed weight (g) combined over 2006-2008 wet seasons at Samaru, Nigeria

	Cutting height (cm)	
Phosphorus (kg P ha^{-1})	10	20
0	19.3^{b}	19.4^{b}
12	18.9^{b}	21.2^{a}
24	18.9^{b}	20.9^{a}
36	19.5^{b}	20.6^{a}
SE ±	0.20	

Mean within a column of any set of treatments followed by different letters are significantly different at 5% level of probability according to the Duncan's multiple range test (DMRT)

a phosphorus application rate of either 12, 24 or 36 kg P ha^{-1} were at par and produced significantly heavier seeds than the no-P control but only in 2007 and the combined data (Table 6).

Cutting height also affected 100-seed weight of lablab in 2007 and in the combined analysis. Cutting lablab at 20 cm produced significantly heavier seeds than cutting at 10 cm. Average 100-seed weight values for the former cutting height were 20.8 g in 2007 and 20.5 g in the combined data, which were higher than that for the latter cutting height.

The response of 100-seed weight of lablab to cutting age was significant across the years (2006-2008) and in the combined analysis. Cutting lablab at age 18 weeks did not allow the production of mature pods and therefore, no seeds were produced in each of the three years of experimentation. Generally, cutting lablab at 6-week age or at maturity produced similar 100-seed weights that were significantly heavier than seeds produced when lablab was cut at 12 weeks, except in 2006 when the earliest cutting (at 6 weeks) produced a 100-seed weight that was significantly heavier than those produced when cutting was done at maturity.

The phosphorus×cutting height interaction in the combined analysis was statistically significant (Table 7). At a constant cutting height of 10 cm, 100-seed weight was similar at all the phosphorus rates. However, when the cutting height was raised to 20 cm, the no-P control, produced a significantly lighter 100-seed weight than the other P application rates of 12, 24 and 36 kg P ha^{-1}, which that were all statistically similar. On the other hand, at a constant rate of phosphorus application, when no P fertilizer was applied 100-seed weight was similar irrespective of cutting height. However, when a P rate of 12, 24 or 36 kg P ha^{-1} was applied; 100-seed weight was significantly heavier when a cutting height of 20 cm was adopted as opposed to the 10 cm cutting height.

DISCUSSION

Response to Phosphorus: Seed yield of lablab did not respond to phosphorus application even though 100-seed weight was increased by 12 kg P ha^{-1} and over relative to the zero P treatment. This favourable response of lablab to phosphorus application could be attributed to the role of this nutrient in forage growth. It has been reported that phosphorus is a nutrient that can promote cell division, fat formation, flowering, fruiting, seed formation and development of lateral and fibrous roots in plants.

The low response to phosphorus application by lablab with reference to the many yield parameters observed in the present study can be interpreted in several ways. The soil properties of the experimental sites such as the medium rating of soil available phosphorus (8.4-17.5 mg kg^{-1}), the strongly to very strongly acidic soils (pH 4.6-5.2) and the medium soil calcium concentration (2.2 -2.8 cmol kg^{-1}) may have acted in concert to cause reduction in lablab response to phosphorus.

When response of six annual legumes to phosphorus (20 kg P ha^{-1} or no P fertilizer) application was evaluated by Kamanga *et al.* (2010) measured grain yields, returns to labour and total costs of P fertilized legumes were compared with those for unfertilized legumes. The application of P fertilizer was said to have increased legume grain yields, particularly velvet bean and soyabean.

Response to cutting height: The present study has shown that whether for cutting or grazing, a higher cutting height is desirable for labour productivity. The higher cutting height of 20 cm produced significantly higher pod length and 100-seed weight of lablab. This implies that lablab cut at 20 cm was able to re-grow faster as well as translocate more assimilates to the reproductive sinks than lablab cut at 10 cm. This is probably because plants cut at a higher level utilized less energy in recovery compared to the latter that were cut to the lower stubble height. This observation is in conformity with the findings of Stockdale (2005) who had earlier reported that aboveground total seed numbers and seed weights were generally greater for the higher defoliation height (7.0 vs. 2.8 cm) of subterranean clover (*Trifolium subterraneum* L.).

Response to cutting age: Cutting age had an overwhelming influence on lablab, having impacted significantly on its yield parameters. The implication of the results of this study in terms of seed production is that cutting or grazing lablab will not necessarily prevent seed production as most lablab producers seem to believe. The seed yields of lablab from plots cut at 6 weeks and at maturity (822 vs. 926 kg ha^{-1}, respectively) were similar. These values are also within the range of lablab seed yields generally reported in the literature. At Samaru-Nigeria, Ewansiha *et al.* (2007), obtained lablab seed yields of 0.6-2.4 t ha^{-1} with some lablab accessions which is similar to that reported while Amodu *et al.* (2003) annunciated seed yields of 1.6-2.3 t ha^{-1} for Highworth lablab that is somewhat higher than what is promulgated in the current study. The seed yield of lablab cut at 12 weeks was 35% lower than those of lablab cut at maturity. This may have been due to the slower rate of crop re-growth rate which significantly delayed the time at which lablab cut at 12 weeks attained 50% flowering. This finding should not deter producers from cutting or grazing lablab at this stage of growth since production of some seed that would be required for future propagation is still possible. This allows for the production of herbage as well as seed for planting.

On the other hand, cutting lablab at 18 weeks inhibited seed production. This implies that when seed production is desired, lablab should not be cut or grazed at or after 18 weeks. The inability of lablab cut 18 weeks to produce seed could be attributed to moisture stress, which prevented adequate crop regrowth and also hindered important physiological processes. In all the three years of the study, cutting at 18 WAS occurred within the month of November, a time in the year when no more rain was received and soil moisture status was very poor. Chaves *et al.* (2003) explained that plant responses to stress are complex but what is unknown are the many traits that explain adaptation to drought such as phenology, hydraulic conductivity and the storage of reserves and these are associated with plant development and structure.

In agreement with the current situation El-Shatnawi *et al.* (2003) attributed the lack of seed production in late-cut wall barley in Jordan to rapid reduction in soil moisture. Inadequate soil moisture causes a decrease in the water status of plant tissues, which in turn negatively affects cell division and cell enlargement. Dry and warmer climatic conditions may be responsible for sharp reduction in hay production since dry climatic conditions reduce the photosynthetic period and trigger earlier maturity in plants (Ball *et al.*, 2001).

Phosphorus×cutting height interaction: The interaction between phosphorus and cutting height for 100-seed weight was statistically significant. Lablab 100-seed weight was heaviest when 12 kg P ha^{-1} was applied along with the higher 20 cm cutting height. Higher defoliation height increased seed weight of subterranean clover significantly (Stockdale, 2005). Seed weights of other legumes were significantly enhanced by phosphorus application. 1000-seed weight of green gram (*Vigna radiata* L. Wilezek) (Mahmud *et al.*, 1996); 100-seed weight of soyabean (*Glycine max* L. Merrill) (Chiezey *et al.*, 2005); 100-seed weight of faba bean (*Vicia faba* L.) (Turk and Tawaha 2002) and 1000-seed weight of chickpea (*Cicer arietinum* L.) (Ali *et al.*, 2004) were increased by 13, 26.4, 17.5 and 26.2 kg P ha^{-1}, respectively. The current interaction was probably due to the applied phosphorus that was available in the soil, which enhanced root growth as well as a larger functional leaf area that was left for photosynthesis after lablab had been cut to a 20 cm stubble height. These factors may have enhanced both crop regrowth as well as assimilate production.

CONCLUSION

Phosphorus application rate of 12 kg P ha^{-1} increased lablab 100-seed weight while a cutting height of 20 cm produced significantly higher 100-seed weight. Cutting lablab at 18 weeks prevented seed production whereas lablab cut at 6 weeks or at maturity produced similar seed yields.

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