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CROP BREEDING AND
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Duration of the growth cycle and the yield potential of potato genotypes

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ABSTRACT - *Most potato cultivars available to growers in Brazil come from temperate countries and present growing cycles around 100 days from planting. The objectives of this study were to establish the relationship between the duration of the growth cycle and the yield potential of potato genotypes in southern Minas Gerais State, Brazil. This study evaluated the tuberization process, the dry matter partitioning at the different plant development stages, and estimated genetic parameters for these traits. One hundred and twenty-one genotypes were evaluated in two experiments which were harvested at 80 days after planting (DAP) and at the end of the growth cycle. In a second study, 23 genotypes were harvested at 58, 83, 108, and 133 DAP. Results suggest that a possible strategy to increase potato tuber yield in the tropics is to select for late clones. Late clones can be harvested around 100 DAP with no reduction in tuber yield and tuber dry matter content.*

Key words: *Solanum tuberosum*, dry matter partitioning, tuberization, earliness, lateness.

INTRODUCTION

Yields of the potato (*Solanum tuberosum* L.) crop are result of the speed and the duration of the period of tuberization (Costa and Lopes 1981), which in turn depends on the longevity of the leaves, the beginning of tuber formation, and on the duration of the growth cycle (Allen and Scott 1980, Spitters 1987, Kooman et al. 1996).

In Brazil, the potato cultivars are, for the most part, introduced from regions of temperate climate and have short growth cycles of around 100 days. The short growth cycle can be attributed to the cultivars' genetic traits and the tropical climate conditions, particularly the short photoperiod and high temperatures (Menzel 1985, Midmore 1990, Lovato 1993, Kooman et al. 1996, Fontes and Finger 1999).

The longevity of the leaves in late cultivars is greater; consequently, the extended period of formation and tuber bulking leads to a significant increase in the tuber yield, which is, partly, due to the longer duration of the growth cycle (Ahmed and Sagar 1981, Griffith et al. 1984, Kooman and Rabbinge 1996). The duration of the growth cycle can

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also be determined by the early initiation of the tubers and by their sink potential which reduces the shoot growth, shortening the growth cycle (Kooman et al. 1996).

On the other hand, Griffith et al. (1984) verified that the cultivars with high initial tuber yields maintain this condition until the end of the growth cycle. This indicates that, in general, high early yields are no limit for a high yield at the end of the growth cycle, as verified by Silva (2004). However, an early harvest, even at an advanced stage of the crop, leads to significant reductions in the percentage of large tubers and the tuber specific gravity (Silva 2004).

At the end of the growth cycle, photoassimilates and nitrogen are remobilized from tuber shoots (Moorby 1970, Millard et al. 1989). This remobilization entails a reduction in leaf longevity and is more articulated in the early cultivars that generally have smaller shoots. This process, which also leads to a reduction in the growth cycle is known as self-destruction of the plant (Kooman and Rabbinge 1996).

Productivity gains can be achieved by a greater number of plant stems (Gutter 1978, Meltzer 1992), since besides increasing the photosynthetic capacity, the photoassimilates stored in the shoot are remobilized, which amounts to about 10% of the tuber bulking (Moorby 1970). Under tropical climate conditions, van Keulen and Stol (1995) confirm that greater productivities could be achieved if cultivars with longer maintenance periods of green leaves, obtained by a better adaptation to high temperatures were used. Under these circumstances, strategies to increase the productivity level could focus on an extended maintenance of the photosynthetically active leaf area, which is directly related to a greater duration of the growth cycle. Gawronska et al. (1984) mention the potential for genetic improvement to combine a long growth cycle with a quick and/or high allocation of photoassimilates to the tubers, with a consequent increment of the final crop yield.

This study investigated the process of tuberization and the partitioning of dry matter to the tubers at different development stages of potato genotypes, taking the duration of the growth cycle into consideration. Furthermore, information on some genetic parameters of these traits was compiled.

MATERIAL AND METHODS

Three experiments were installed in the winter crop season, on the experimental area of Departament of Biology of Federal University of Lavras (UFLA), in Lavras, State of Minas Gerais, 21° 14' S, 40° 17' W, and 918 m asl, Brazil. The fist two experiments were conducted in parallel from May to August 2002, with the objective of evaluating the effect of an early harvest and of the growth cycle duration on yield traits. The third experiment was carried out from May to October 2003, aiming at more in-depth studies on the relation between the duration of the growth cycle and the productive potential. A fertilization of 3.0 t ha^{-1} of the formula 4-14-8 (N, P$_2$O$_5$, K$_2$O) was used in all experiments, and the assays were grown under sprinkling irrigation. Crop management practices normally used by farmers of the southern region of Minas Gerais state were applied.

The genetic material used in the two first experiments were 116 clones obtained by Martins and Pinto (1996). The cultivars Achat, Asterix, Atlantic, Jaette-Bintje, and Monalisa were used as controls. The experimental design was in randomized blocks with three replications in plots of five plants, spaced 0.30 x 0.80 m. In the first experiment, the harvest was anticipated to 80 days after planting (DAP), while in the second, the harvest was realized at the end of the growth cycle.

Yield and quality traits of the tubers were evaluated. The tuber specific gravity was estimated by the method of weight in the water and weight in the air, weighed on a hydrostatic balance. The growth cycle was estimated in number of days from planting to when 50% of plants in the plot were in complete senescence. The tuberization speed in the linear phase of tuber bulking was estimated for the early harvest, dividing the tuber yield by 40 days, which corresponded, in the mean, to a period of tuber bulking until the harvest (that is, from 40 DAP to 80 DAP). For the harvest at the end of the cycle, the tuberization speed was obtained by dividing the increment in tuber yield between the early harvest and the harvest at the cycle end, by the number of days between the two harvest periods.

In the third experiment, 20 clones obtained from the previous assays with strongly contrasting growth cycles were used, besides the cultivars Achat, Asterix, and Monalisa. The experimental structure was a randomized block design, in a split plot scheme, with four replications and two plants per plot, spaced 0.30 x 0.80 m. The plots consisted of four harvest periods (58, 83, 108, and 133 DAP) and the subplots of the 23 genotypes. Besides the traits evaluated in the assays of 2002, data of the shoot yield dry matter and dry matter partitioning to the tubers were included. The tuberization speed was estimated for each harvest period dividing the increment in tuber yield by the number of days of the period. In the case of the harvest at 58 DAP, it was considered that tuberization had begun 40 DAP, that is, it lasted 18 days. A period of 25

days was considered for the harvests at 83 and 108 DAP (that is, from 58 to 83 DAP and from this to 108 DAP). For the last period the number of days between the harvest at 108 DAP and the end of the growth cycle of each clone was considered. The clones were considered random and the harvest periods fixed for the statistical analyses. The broad sense heritabilities were estimated according to Vencovsky and Barriga (1992). The equations of regression were obtained by the least square method (Steel et al. 1996) and the maxima points obtained by derivation.

RESULTS AND DISCUSSION

The difference in tuber yield observed between the early and the end-of-cycle harvest was only 3% and statistically not significant (Table 1). In the mean, the vegetative period between 80 DAP and the end of the cycle did not yield a productivity increase. However, the earlier clones did in fact not raise the productivity significantly, since at 80 DAP the growth cycle was almost complete. The productivity increase in this period must be ascribed, principally, to the performance of the later clones. Forty-three clones (36%) presented shorter growth cycles, while 78 clones (64%) had longer growth cycle. The percentage of large tubers and tuber specific gravity presented significant increases between the early harvest and the harvest at the cycle end (Table 1), demonstrating a considerable accumulation of dry matter in the tubers after the linear phase of bulking. On the other hand, the tuberization speed was significantly reduced in the same period, reflecting the lower speed of tuber bulking at the end of the growth cycle, as described by Costa and Lopes (1981). Similar results are broadly documented in literature (Fontes et al. 1978). The early vine desiccation, recommended for the production of potato-seeds, has the objective of avoiding the development of very large tubers, besides impairing the translocation of viruses to the tubers. The higher tuberization speed observed in the early harvest was due to the linear period of tuber bulking, while the tuberization speed diminished owing to the beginning of plant senescence in the harvest at the cycle end (Table 1).

When only the most discrepant clones in relation to the growth cycle were considered (mean difference of 20 days), the later clones presented higher means than the earlier clones, in the early harvest as well as in the harvest at the cycle end (Table 2). For the early harvest, this superiority was approximately 71% for tuber yield, 80% for the percentage of large tubers, and 71% for tuberization speed, in agreement with results of Griffith et

al. (1984). For the harvest at the cycle end, the later clones were 187% more productive, produced 110% more in the percentage of large tubers, and presented a 215% higher tuberization speed. The greater tuber yield of the later clones can therefore be ascribed to the higher tuberization speed of these genotypes, together with the greater available period for tuber bulking.

The tuberization speed can be considered one of the main determinant factors of the productive potential, causing a greater tuber yield and higher percentage of large tubers in the later clones, even in the early harvest. These results are supported by the study of Ahmed and Sagar (1981), who also demonstrated that the tuberization speed and the duration of the total tuber bulking period were the responsible factors for the greater yield.

In a comparison of the clones of the same maturity class in the two harvest periods, a reduction of 26% was observed in the early clones' tuber yield. The tubers were maintained on the field until all plants (early and late clones) were in complete senescence for the harvest, resulting in losses due the metabolism of the tubers and also by rots. For the percentage of large tubers, the means remained practically unaltered (27.07 vs. 28.69%), as well as the tuber specific gravity. The tuber yield of the late clones increased 23% and the percentage of large tubers 24%. Analogous, the tuber specific gravity increased by 0.0067 units (Table 2), which corresponds to a significant increase in tuber dry matter content and is expressed in a better frying quality. The tuberization speed of the clones of the two maturity classes dropped drastically, although this effect was greater for the early (- 84%) than the late clones (- 71%). The tuberization speed of some earlier clones was zero or very low in the harvest at the cycle end, demonstrating an interruption of dry matter accumulation in the tubers. On the other hand, the late clones still had a tuberization speed of about 50% of the observed for the earlier clones in the early harvest (4.48 vs. 9.16 g plant^{-1} day^{-1}) in the harvest at the cycle end. This can be attributed to a greater longevity of the clone leaves in the longer growth cycle (Kooman and Rabbinge 1996), allowing photosynthesis even after 100 DAP.

The estimate of the broad-sense heritability for the growth cycle was moderate (0.55), but allows the conclusion that the selection of later clones should not be difficult. The estimates of the heritabilities varied from 0.70 to 0.74 for the other traits, indicating sufficient variability for the selection of superior clones. In the case of tuberization speed, the heritability estimate was 0.70 in the early harvest, but zero in the harvest at the cycle end. These results indicate that selection for this trait could only be realized for the linear phase of tuber bulking (up to 80 DAP, approximately). After this period the coefficient

of experimental variation was very high (Table 2), making selection for this trait unfeasible.

The experiment of 2003, involving four harvest periods, aimed to establish the probable relations of the productive potential with the duration of the growth cycle. The 23 clones were classified in eight maturity groups. The duration of the growth cycles varied from 99.8 to 128.5 DAP, with a mean of 113.3 DAP. High correlations were observed between tuber yield and shoot dry matter content (r = 0.77**) and the tuberization speed (r = 0.80**) in the four harvest periods. Only after 133 DAP did the tuberization speed not present significant correlation with the shoot dry matter. This result had been expected, since at 133 DAP most plants were already completely senescent. The total number of tubers per plant was correlated to the shoot dry matter in the four harvest periods, demonstrating that a well-developed shoot permits the formation of a greater number of tubers, which may be a reflex of the presence of more stems and leaves in the plant (Meltzer 1992). Gutter (1978) pointed out that the number of tubers formed is directly proportional to the number of stems per plant.

Shoot dry matter was also correlated to the growth cycle in the same magnitude (r = 0.61**) until the harvest at 108 DAP. At 133 DAP the correlation coefficient increased considerably (r = 0.80**) since the late clones continued to vegetate for a longer time, that is, to accumulate photoassimilates for a longer period. Besides, from the initial development stages of the plant, the vegetative growth was more accelerated in the late clones. The vigorous growth of the late clones, besides being related to the greater photosynthetic capacity, is also important for an increase in the remobilization of photoassimilates to the tubers towards the end of the growth cycle (Moorby 1970, Gawronska et al. 1984). Moreover, the growth cycle was correlated to tuber yield from the harvest at 83 DAP (r = 0.49*) on, and the correlation coefficient gradually increased until the last harvest (r = 0.66**). Thus, the only stages where the late clones were not more productive than the early ones were the initial development stages (until 58 DAP).

The trait means of the four harvest periods, estimated by regression equations, as well as the maximum expected value and the period when this value would be reached are presented in Table 3. With exception of the shoot dry matter and the tuberization speed, the other traits reached their peak points after 100 DAP (Table 3). The shoot dry matter content reached its peak 88.4 DAP, but had already attained nearly 83% of this maximum value at 58 DAP, demonstrating that the plant development occurs during the initial development stages. The tuberization speed was higher between 58 and 83 DAP, which corresponds to the

Table 1. Means of the tuber yield, percentage of large tubers, tuber specific gravity, and tuberization speed for the early (experiment 1) and end-of-cycle harvest (experiment 2)

Harvest	Tuber yield	Large tubers	Tuber specific	Tuberization speed
	g plant^{-1}	%	gravity	g plant^{-1} day^{-1}
Early	546.21 a*	44.41 a	1.0667 a	13.66 b
End of cycle	563.86 a	51.39 b	1.0718 b	3.01 a

* Means followed by the same letter in each column did not differ from each other by the test of Scott-Knott at P < 0.05

Table 2. Means and coefficients of experimental variation for tuber yield, percentage of large tubers, tuber specific gravity, tuberization speed and duration of the growth cycle, considering the ten earliest clones, the ten latest clones and the five cultivars in the early (experiment 1) and end-of-cycle harvest (experiment 2)

Harvest	Genotypes	Tuber yield	Large tubers	Tuber specific	Tuberization speed	Growth cycle
		g plant^{-1}	%	gravity	g plant^{-1} day^{-1}	days
Early	Early clones	366.23 a*	27.07 a	1.0645 a	9.16 a	-
	Late clones	626.93 c	48.61 b	1.0684 a	15.67 c	-
	Cultivars	542.13 b	52.32 b	1.0647 a	13.55 b	-
	CV (%)	26.46	33.03	0.47	24.65	-
End of cycle	Early clones	269.07 a	28.69 a	1.0683 a	1.42 a	99 a
	Late clones	771.33 c	60.19 b	1.0751 b	4.48 a	119 c
	Cultivars	658.80 b	51.32 b	1.0731 b	4.63 a	111 b
	CV (%)	31.32	33.54	0.59	96.16	6.14

* Means followed by the same letter in each column and for each harvest period did not differ from each other by the test of Scott-Knott at P < 0.05

linear period of tuber bulking (Costa and Lopes 1981). The maximum value was attained at 69.2 DAP (Table 3). From this period onwards, the tuberization speed sank in function of the plant senescence. For tuber yield, percentage of large tubers, tuber specific gravity, mean tuber weight, and dry matter partitioning to the tubers, the peak points were observed 108 DAP, though in this period the means already attained over 95% of the maximal value, indicating that the advance of the growth cycle would not be very beneficial. The number of tubers per plant had a linear tendency ($R^2 > 0.98$) and at 108 DAP the mean represented close to 81% of the maximal value (Table 3). However, the increments in tuber numbers per plant at the end of cycle represented only small-sized tubers, without commercial value.

Afterwards, to understand the growth and development of the clones better, only the five earliest and five latest clones were chosen for more in-depth studies. The late clones' tuber yield peaked out 129.8 DAP while that for the earlier maximum production was attained 113.3 DAP. For the early clones there was no significant increase in tuber yield at 108 DAP. However for the late clones there was an increment of approximately 7% between 108 DAP and the peak point. This was nearly exclusively caused by clone PRM 167, while for the other clones there was no significant increase. This shows that the harvest of the late clones could be anticipated to 108 DAP, without a significant drawback for tuber yield. The late clones were always more productive than the early ones; these differences increased with the advance of the harvest period (Figure 1 A). A similar performance was verified for the percentage of large tubers and mean tuber weight (Figures 1B, 1E).

At 58 DAP, about 88% of the maximum number of tubers per plant had already been formed in the early clones, showing that the number of tubers is defined, to a great

extent, at the initial plant development stages, in agreement with Gutter (1978) and Ahmed and Sagar (1981). The late clones, in turn, presented an increasing tendency of the number of tubers. Fifty-eight DAP they presented 66% of the maximum value and at 83 DAP they attained about 83% of the maximum value. As tubers developed later would have little time to accumulate dry matter, it is believed that these would not be important for commercial production. In fact, it was observed that there was no increase in the percentage of large tubers after 108 DAP (Figure 1B). It is important to point out that up to 58 DAP there were no tubers that fit in the large size category (Figure 1B).

The maximum values for tuber specific gravity were attained very close in time (117.1 and 114.7 DAP for the early and late clones, respectively - Figure 1C). In the harvest carried out at 133 DAP there was a reduction in the value of this trait, which can be ascribed to the dry matter loss of the tuber due to its metabolism. After the harvest realized at 83 DAP, the specific weight of the tubers already attained a high value, which corresponds to approximately 20% of the tubers' dry matter, which is considered an acceptable value, even for the potato processing industry.

At 58 DAP, the shoot dry matter represented, in the mean, over 80% of the maximum value of the total dry matter, demonstrating that the formation of stems and leaves occurs in greater measure during the initial phase of plant development. Maximum values occurred at 82.5 DAP and 97.7 DAP for the early and late clones, respectively. There was a reduction of 62% in the shoot dry matter of the early clones and only 18% for the late clones in the harvest at 133 DAP, in relation to the maximum values. Part of this reduction can be attributed to natural senescence and to the remobilization of dry matter to the tubers (Kooman and Rabbinge 1996, Moorby 1970), but,

Table 3. Estimated means of 23 potato genotypes for tuber yield, percentage of large tubers, tuber specific gravity, total number of tubers per plant, mean weight of tubers, shoot dry matter, dry matter partitioning to the tubers and tuberization speed, in four harvest periods and maximum expected values

Trait.	Harvest period				Maximum	
	58 DAP*	83 DAP	108 DAP	133 DAP	Value	DAP
Tuber yield (g plant⁻¹)	383.28	961.30	1279.07	1336.59	1346.72	126.1
% of large tubers	2.35	55.57	78.68	71.65	79.75	114.7
Tuber specific gravity	1.0604	1.0718	1.0754	1.0720	1.0756	108.3
Total nr. of tubers plant⁻¹	11.05	12.69	14.08	15.22	17.28	234.5
Mean tuber weight (g)	35.02	77.80	96.71	91.75	97.73	115.3
Shoot dry matter (g plant⁻¹)	37.63	45.33	42.29	28.49	45.58	88.4
Dry matter partitioning to the tubers (%)	64.10	77.29	85.72	89.40	89.58	139.9
Tuberization speed (g plant⁻¹ day⁻¹)	21.53	21.33	17.12	8.91	21.94	69.2

* DAP: days after planting

in the case of the early clones, the greatest reduction must have occurred owing to losses of parts of vegetative organs in the period from 108 DAP until the harvest since the plants were nearly completely dry at 108 DAP. The late clones were always more vigorous (greater shoot dry matter content) than the early ones, expressing the potential of these clones of a greater available photosynthetically active leaf area (Figure 1F).

Dry matter partitioning to the tubers increased progressively throughout the four harvest periods, which had been expected, since as the plants develop, the proportion of dry matter allocated to tuber formation increases. The dry matter partitioning to the tubers increased continuously (Figure 1G), with maximum values close to the final period of harvest, indicating that the further the plants develop, the greater the proportion of dry matter that is allocated to tuber formation, in detriment of the shoot.

The tuberization speed was greater for the late clones throughout all harvest periods (Figure 1H), demonstrating that the late are more efficient than the early clones at tuberization. Maximum values were observed at 68.7 DAP and 79.4 DAP for the early and late clones, respectively. At 133 DAP the tuberization speed of the late clones represented nearly 80% of the maximum value obtained by the early clones. In the same period, the early clones were already completely dry, and tuberization was zero. The

greater longevity of the shoot of the clones with a longer growth cycle is responsible for the extension of the tuber bulking period, as verified by Kooman and Rabbinge (1996).

Considering all harvest periods, the late clones outstripped the early clones by 67% for tuber yield, 12% for the percentage of large tubers, 52% for the total number of tubers per plant, 110% for the shoot dry matter, and 82% for the tuberization speed (Table 4). On the other hand, the early clones outstripped the late clones only in the dry matter partitioning to the tubers (80.17 vs. 75.22%). However, it must be stressed that the total dry matter of the late clone plants was considerably superior to that of the early clone plants, which means that the late clones partitioned, proportionally, a greater quantity of dry matter to the tubers. Although the early clones had been superior to the late in tuber specific gravity, this difference is not significant from the practical point of view. There were no significant differences between the two clone groups for the mean tuber weight.

The greater tuber yield of the late clones in relation to the early clones was evident in the present study. This result was probably consequence of the greater photosynthetic efficiency of the late clones, which presented a more vigorous vegetative growth and greater longevity of the shoot. The greater photosynthetic efficiency also increased the tuberization speed throughout the tuber bulking period. This trait resembles

Table 4. Means of the growth cycle (GC), tuber yield (TY), percentage of large tubers (LT), mean weight of large tubers (WLT), tuber specific gravity (TSG), total number of tubers per plant (NTP), mean tuber weight (TW), shoot dry matter (SDM), dry matter partitioning (DMP) to the tubers and tuberization speed (TS) for early and late clones

Clones	GC days	TY g plant^{-1}	LT %	WLT g	TSG	NTP tuber plant^{-1}	TW g	SDM g plant^{-1}	DMP %	TS g plant^{-1} day^{-1}
Early										
PRM.141	99.8 a*	583.25 a	58.08 b	114.39 b	1.0629 a	8.38 a	78.49 a	27.48 a	75.16 a	10.59 a
CBM.6.21	101.8 a	732.75 a	36.06 a	78.51 a	1.0879 e	11.19 b	68.18 a	28.36 a	83.23 b	13.47 a
PRM.530	102.0 a	561.25 a	51.93 b	91.94 a	1.0664 b	7.81 a	81.46 a	20.23 a	79.90 b	9.57 a
CBM.16.15	103.8 a	1107.06 b	47.98 b	94.43 a	1.0785 c	14.44 c	80.46 a	37.78 b	82.63 b	17.37 a
PRM.250	104.0 a	756.06 a	50.63 b	91.74 a	1.0833 d	10.63 b	71.58 a	32.25 b	79.95 b	11.54 a
Mean	102.3 A#	748.08 A	48.94 A	94.20 A	1.0758 B	10.49 A	76.03 A	29.22 A	80.17 B	12.51 A
Late										
PRM.002	123.0 a	886.50 a	49.17 a	91.30 a	1.0709 a	13.56 a	67.63 a	33.32 a	80.50 c	17.76 a
PRM.369	123.3 a	1376.25 b	61.42 b	102.73 a	1.0679 a	17.69 b	77.36 a	56.65 b	75.53 b	25.75 b
PRM.426	124.8 a	1024.31 a	43.23 a	101.05 a	1.0757 b	14.13 a	67.49 a	70.20 c	67.95 a	16.48 a
PRM.167	128.5 b	1616.81 c	57.81 b	138.08 b	1.0779 b	19.44 b	81.27 a	78.63 c	75.37 b	32.16 b
CBM.9.10	128.5 b	1336.00 b	62.05 b	108.51 a	1.0769 b	14.69 a	94.06 b	68.35 c	76.73 b	21.51 a
Mean	125.6 B	1247.98 B	54.74 B	108.33 B	1.0738 A	15.90 B	77.56 A	61.43 B	75.22 A	22.73 B
VC$_e$ %	1.62	32.06	25.30	25.84	0.41	30.0	25.71	32.90	6.48	87.69

*Means followed by the same letter in each column within the types of clones did not differ from each other by the test of Scott-Knott at P<0.05. # Capital letters compare the means between the clone types
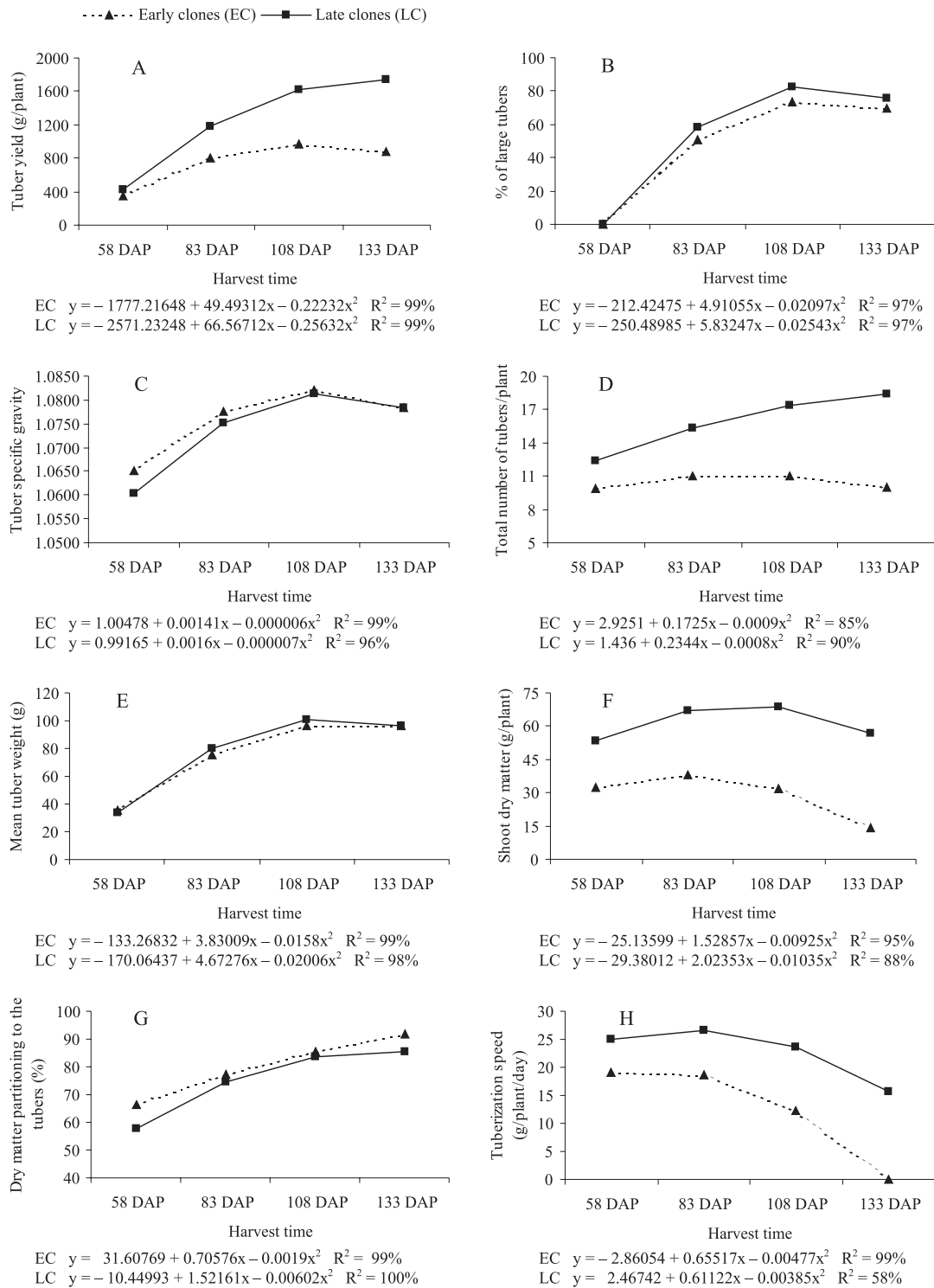
Figure 1. Tuber yield (A), percentage of large tubers (B), tuber specific gravity (C), total number of tubers per plant (D), mean tuber weight (E), shoot dry matter (F), dry matter partitioning to the tubers (G) and tuberization speed (H) of the early (EC) and late clones (LC) in four harvest periods

the stay greenphenomena observed in various species, such as maize, wheat, soybean, tobacco, among others, cited by Thomas and Smart (1993). This greater photosynthetic efficiency grants the late clones advantages which allows harvesting in a similar period as the early clones (around 100 DAP).

The selection of late (or photosynthetically more efficient) clones is therefore suggested as a possible strategy to increase the productivity of potato in tropical and subtropical regions. The selection of late clones is relatively easy due to the moderate heritability for this trait. However, more studies are needed to reinforce the feasibility of this proposal.

Duração do ciclo vegetativo e o potencial produtivo de genótipos de batata

RESUMO - *A maioria das cultivares de batata disponíveis no Brasil é importada, com ciclo vegetativo curto, em torno de 100 dias. Investigou-se a relação entre a duração do ciclo vegetativo e o potencial de produção de genótipos de batata no sul de Minas Gerais. Avaliou-se o processo de tuberização, a partição de matéria seca nos diferentes estádios de desenvolvimento da planta, e estimaram-se os parâmetros genéticos para ambos os caracteres. Um total de 121 genótipos foram avaliados em dois experimentos; um colhido aos 80 dias após o plantio (DAP) e o outro ao final do ciclo vegetativo. Em um segundo estudo foram avaliados 23 genótipos colhidos aos 58, 83, 108 e 133 DAP. Os resultados sugerem que uma das estratégias possíveis para aumentar a produtividade da cultura da batata nas regiões tropicais é a seleção visando o aumento do ciclo vegetativo. Clones tardios podem ser colhidos em torno de 100 DAP, sem redução na produção e no conteúdo de matéria seca dos tubérculos.*

Palavras-chave: *Solanum tuberosum*, partição de matéria seca, tuberização, precoce, tardio.

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