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On the Tuber-Development of four Important Varieties of Potato in the Nilgiris

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Introduction: In the State of Madras, the Nilgiris district enjoys a cool, equable climate and is well suited for potato cultivation. No less than three crops are raised in a year. When there is demand in the market the ryots harvest their crop even before the haulms have dried up. With a view to find out the correct stage of harvest to secure maximum yield, a study of the tuber development in four of the more important commercial varieties of potato that come up well in the Nilgiris was undertaken.

The literature giving information on tuber development in potato is very scanty. Werner (1917) working at the North Dakota Station, U. S. A. found that tubers of the variety Green Mountain harvested in August 10, 20 and 30 and in September 8 and 11 showed a daily increase of 2. 34 bushels during the last 3-day interval. The total yield secured in August 10 was 121·6 bushels per acre, as compared against 220 bushels secured in September 11. Kohler (1909) experimenting with the variety Early Ohios at the Minnesota University Farm, by digging tubers at 7-day intervals from July 31 to August 30 obtained a daily increase of marketable potatoes at the rate of 7·18 bushels per acre. The daily gain near the end of the period was lower as the foliage died.

Material and Methods: The four varieties studied included Great Scot, Royal Kidney, Duke of York and President. These were planted in the summer of 1949. Uniform seed tubers weighing 2 ounces were used. The plot received a basal dressing of farm yard manure and the modified Nanjanad manure mixture at the usual rate.

The sprouts emerged from the soil after three weeks from planting. Tubers from 10 plants were dug out and their weights recorded at 10-day intervals, beginning from the 50th day after planting as the tuber formation is known normally to start from the 45th to the 50th day of planting.

Experimental Results: The average weight of tubers from a single plant calculated from 10 plants and the percentage of weight to the final weight for all the varieties under trial are furnished below:

TABLE-I.

	Great Scot (Duration 110 days)		Royal Kidney (Duration 110 days)		Duke of York (Duration 120 days)		President (Duration 120 days)	
	Weight in grams	% of weight to the final wt.	Weight in grams	% of weight to the final wt.	Weight in grams	% of weight to the final wt.	Weight in grame	% of weight to the final wt.
Harvested 50 days after planting	0·03	0·006	0·4	0·10	0·14	0·02	3·9	0·87
do. 60 days	11·4	2·51	10·5	2·74	2·5	0·50	32·2	7·21
do. 70 days	40·0	8·81	22·0	5·74	20·0	4·03	3·91	8.75
do. 80 days	216·0	47·61	108·0	28·22	98·0	19·75	118·0	26·43
do. 90 days	354·4	78·13	368·6	96·31	290 6	58·57	297·7	66·67
do. 100 days	439·4	96·86	382·7	100·0	482·0	97·15	447·5	100·0
do. 110 days	453·6	100·0	382·7	...	496·1	100·0	446·5	...
do. 120 days	453·6	...	...	...	496·1	...	...	...

It will be seen from the table that the tuber development in all the varieties is slow till the 70th day of planting. The rate of development, is maximum by the 80th day of planting. This is more or less in agreement with the findings of Clark (1921) working on the conditions attending the development of potato tubers at the Colorado Potato Experimental Station at Greeley. Further it will be noticed, that the maximum rate of tuber development occurs between the 70th and the 90th day after planting in the case of Great Scot, between the 80th and the 90th day for Royal Kidney and between the 80 and the 100th day for Duke of York and President. Thus, assuming that an acre of potato crop yields 10,000 lbs. of tubers, the daily increase during the period of maximum production is 346 lbs. per acre in Great Scot, 681 lbs. per acre in Royal Kidney, 387 lbs. per acre in Duke of York and 368 lbs. per acre in President.

The duration of the varieties from the planting to the drying up of the haulms under Nanjanad conditions, were 110 days for Great Scot and Royal Kidney and 120 days for President and Duke of York. It was also noticed that whenever the tubers were dug out before the haulms dried up, there was profuse skin peeling in the tubers which lowers their market value.

Conclusion: In the Nilgiris, Great Scot is the chief commercial variety and the tuber development in this is complete when the haulms are just drying up (vide Table-I). If harvested before the haulms dry up there is loss of yield depending on the time of harvest. For example, in the case of Royal Kidney and President although tuber development is complete in 100 days the haulms do not dry up till after 10 days in the former and 20 days in the latter. There is no loss in the yield, however, if the crop is harvested when the haulms have completely dried down. In order to prevent skin peeling and to obtain maximum yields it is desirable to harvest the crop when the haulms have dried completely.

Summary: Four varieties namely Great Scot, Kidney, Duke of York and President were studied for tuber development

Tuber development in all these varieties is slow till the 70th day after planting.

The duration and the time of commencement of the maximum rate of production and also the time of completion of the tuber development seem to vary with varieties and appear to bear no definite correlation with the vegetative duration of the crop from time of sprouting to the time of dryage of the vines.

The crop continues to remain green for sometime even after the completion of the tuber development in the case of Royal Kidney, Golden Wonder and President and hence harvesting of these at this stage does not affect the yield, but the tubers undergo skin peeling when a potato crop is harvested before the vines dry up and therefore affects the quality of the produce. To obtain maximum yield and good quality tubers it is desirable to harvest the crop when the haulms have completely dried.

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