संख्या / No. : Comb – 125/1628/2014 माह / Month: July, 2014

गोपनीय परीक्षण रिपोर्ट
CONFIDENTIAL TEST REPORT

व्यावसायिक परीक्षण रिपोर्ट में परिवर्तित
CONVERTED TO COMMERCIAL TEST REPORT

COTTON PICKER
'JOHN DEERE 4MQ-1 (CP20)'

सत्यमेव जयते

भारत सरकार
कृषि मंत्रालय
कृषि एवं सहकारिता विभाग)

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE & COOPEARATION)

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Spindles of 2nd picking drum			
1	196.0	195.2	0.41
2	196.5	195.7	0.41
3	196.5	195.8	0.36
4	196.5	195.9	0.31
5	196.0	195.2	0.41
6	196.0	195.2	0.41
7	196.5	195.8	0.36

7.10.2 Wear assessment of spindle (dimensional basis)

S. no.	Initial length of spindle, mm	Length of spindle after 100 hours of operation, mm	Wear %
1st Picking drum			
1	65.00	64.30	1.08
2	65.31	64.68	0.96
3	65.10	64.56	0.83
4	64.96	64.07	1.37
5	64.94	64.00	1.45
6	65.20	63.80	2.15
2nd picking drum			
1	64.68	63.84	1.30
2	64.91	64.38	0.82
3	64.85	64.15	1.08
4	64.74	63.71	1.59
5	64.94	64.33	0.94
6	64.23	64.01	0.34
7	64.94	64.20	0.78

Wear of spindle on mass basis ranged from 0.10 to 0.41% and on dimensional basis ranged from 0.34 to 2.15%

8. FIELD TEST

The 1st growth regulator was applied after 45 days of planting. 2nd & 3rd dose of growth regulator were applied after 15 days of interval to restrict the height of the plants in order to make it suitable for picking with the cotton picker. Drop ultra chemical for defoliation was applied at 70% opening of cotton bolls . The picker was used after the 10 days when the 85% bolls were opened.

The cotton picker fitted with John Deere 5050E V5 (collar shift) tractor at engine throttle setting corresponding to 2400 rpm was tested in field for 100 hours for picking the seed cotton bolls from the cotton crop. Field performance of cotton picker was assessed with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction etc. The crop and field conditions as observed during field tests are given in annexure I and summarized as under.

Table summary of crop and field conditions

S. No.	Parameters	Range of parameters
1.	**Method of sowing**	**Planter**
2.	Variety of crop	Ist class and Bhakti
3.	Plant height, cm	93.0 to 160.0
4.	Plant width, cm	32.0 to 105.0
5.	Row to row spacing, cm	67.0 to 89.0
6.	Plant to plant spacing, cm	9.0 to 45.0
7.	Number of bolls/plant	5 to 17
8.	Boll moisture (%)	6.0 to 10.0
9.	No. of locuels per boll	2 to 4
10.	Ratio of cotton seed to lint	1.46:1.00 to 1.70:1.00

The other cultivation practices adopted as pre requisite for with picker.
The field performance observation are given in annexure II and summarized as under

S. No.	Observations	Range of observations
1	Speed of operation, km/h	4.75 to 5.87
2	Area covered, ha/h	0.304 to 0.399
3	Time required for 1 hectare, h	2.5 to 3.3
4	Seed cotton output, kg/ha	621.6 to 2048.8
5	Fuel consumption l/h l/ha l/q	 5.630 to 6.800 14.816 to 19.257 0.724 to 2.956
6	Spindle cleaning solution consumption, l/h	13.056 to 22.500
7	Plant loss, %	1.27 to 4.07
8	Ground loss, %	0.57 to 3.77
9	Total loss, %	1.97 to 7.10
10	Picking Efficiency, %	92.90 to 98.03
11	Trash content observed during 1. Manual ginning 2. Remaining trash content in chemical analysis	 6 to 11.8% 3.86 to 5.34%
12	Processing losses (%)	11.3 to 17.5
13	Cleaning efficiency (%)	82.5 to 88.7

8.1 Quality of Work

It refers to losses due to operation of cotton picker picking efficiency of machine and percentage of trash content in the seed cotton. Plant loss ranged from 1.27 to

4.07, ground loss 0.57 to 3.77% and the total of plant loss and ground loss ranged from 1.97 to 7.10% the picking efficiency varied from 92.90 to 98.03%. Total trash contents ranged from 11.3 to 17.5%.

8.2 Rate of working performance

i) Rate of work of cotton picker consists of area covered per unit time which ranged from 2.5 h/ha to 3.3 h/ha

ii) Fuel consumption of the tractor to operate the cotton picker ranged from 5.630 to 6.800 l/h.

iii) Consumption of spindle cleaner solution ranged from 13.056 to 22.500 l/h.

iv) Spindle cleaner solution filled in a tank of capacity about 90 litre hence it is required to fill after each 4 to 5 hours of operation.

8.3 Long duration test and night trial

The picker was operated continuously for 10.0 hours to observe the behaviour of various functional components in long run. The rate of work and fuel consumption in long run test was observed 0.380 ha/h and 5.630 l/h respectively. A night trial of two hours duration was also conducted at the time of long run test of assess the intensity and suitability of lighting equipment for the night work. The intensity of lights were found adequate for the night operation. Seed cotton tank filing was clearly visible in the night hours. The light intensity was sufficient to work during the night & there was no any sign of breakdown was occurred during the test No breakdown of lightening system occurred during 2 hours of night trial.

9. EASE OF OPERATION AND HANDLING

Cotton picker is easy to operate. Picking unit is visible to operator and controls of picker unit are assessable to operator. Display of ground speed and picking unit speed is provided in addition to display on tractor dash board. Therefore no specific problem was noticed in manoeuvring of the cotton picker.

10. SOUNDNESS OF CONSTRUCTION

No breakdown occurred in 100 hours of operation of cotton picker during it field tests. No modification or adjustment required in throughout the field tests to improve in quality or rate of work.

11. LABOUR REQUIREMENT

Prior to each test one man hours were required for daily maintenance of tractor and cotton picker. One skilled operator is sufficient to operate the machine for cotton picking. Additional helper is required to support at the time of maintenance and to relieve main operator for rest. Extra labours are required to transport the seed cotton from the field to storage place.

12. COMMENTS AND RECOMMENDATIONS

1. Plant losses ranged from 1.27 to 4.07%, ground losses ranged from 0.57 to 3.77% and total losses varied from 1.97 to 7.10%. This should be examined & improved.
2. Picking efficiency varied from 92.90 to 98.03% in 100 hours of field tests. This should be examined & improved.
3. Trash content varied between 11.3 to 17.5% in 100 hours of field testing. Percentage to trash content should be reduced to hand picking level at the production level.
4. Rate of work varied between 0.304 to 0.399 ha/h and fuel consumption ranged from 5.630 to 6.800l/h.
5. Consumption of spindle cleaner solution varied from 13.056 to 22.500 l/h.

6. (a) The cotton picker requires specific variety of cotton to be sown at specific row and plant distance.
   (b) The plan growth regulator application is necessary to restrict the plant growth.
   (c) Use of defoliant is required before harvesting/picking. The above parameters should be commercially examined for the viability of cotton picker among farmers.

13. LITERATURE

Operator's manual, service manual and parts catalogue is provided by the applicant which is adequate in contents. The operator manual should be modified in accordance with IS:8132-1999 in Hindi and other regional languages for the guidance of farmers used and technicians.

TESTING AUTHORITY

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Test conducted and test report compiled by: **Sh. R.M. Tiwari, A.E**

APPLICANTS COMMENTS

Editorial comments incorporated in test report.