APPLICATION OF COMBER DATA VER 2.0 TO SPINNING MILLS

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1.1 Description of the Pc-Program

Comber Data Pc-Program makes use of Itru Fibre Tester UAK-1 to compute important fibre parameters and optimum noil percentage as well as to check the functioning of nippers,top comb and combing cylinder through Knowledge Based Problem Analyses and Problem Solving Techniques to improve combed yarn quality ,reduce combing noil %, improves yield performance ,ring spinning efficiency and productivity, optimizes combing noil % according to given fibre type and checks the performance of comber.

Mill Performance Improvement and Benefits
=-Reducing combing noil to minimum value for a given mix.
=-Improving yarn quality
=-Improving ring spinning performance
=-Finding out faulty running parts of combing machine such as nippers,top comb penetration
distance and combing segment
=-Finding out faulty prior processes to combing
=-Improving knitting yarn performance due to improving yarn evenness and imperfections
Through our research work better yarn quality has been achieved by reducing combing noil % from 17 % to finally 10 % with Comber Data Pc-Program

1.2 Comber Data Sheet

Item #	***Item***	***Data***
1	Machine No	1
2	Lot Number	A-12
3	Test Date	12/02/17
4	Type of Cotton	Ege
5	Type of Delivery	Single
6	2,5 % Weighted Span Length in mm Lap Back	
7	50 % Weighted Span Length in mm Lap Back	
8	2,5 % Weighted Span Length in mm Lap Front	
9	50 % Weighted Span Length in mm Lap Front	
10	2,5 % Weighted Span Length in mm Sliver Back	
11	50 % Weighted Span Length in mm Sliver Back	
12	2,5 % Weighted Span Length in mm Sliver Front	
13	50 % Weighted Span Length in mm Sliver Front	
14	2,5 % Weighted Span Length in mm Noil	

15	50 % Weighted Span Length in mm Noil	
16	Number of Lap Heads	
17	Comber Sliver count in Gram per meter	
18	% of Combed Noil Measured	
19	Lap Gram per meter	
20	Total Mechanic Draft	
21	Detaching Roller Setting in mm	

Comber noil % constitutes the 50 -60 % of total waste in combed yarn manufacturing . Therefore 1% in reduction in combing noil % is very important. To reduce combing noil % is not simply reduce the combing noil % but by means of scientific methods to optimize the process and minimize the costs of manufacturing . This involves scientific approach to the problems and potentials related combed yarn manufacturing.

Combing machine consists of following main items to comb the feed lap.

-Nippers
-Top Comb
-Combing Segment
-Detaching Roller
-Lap feed roller
-Drafting System

Any malfunction of above items could deteriorate the quality of combed sliver hence yarn quality .

The purpose of combing can be summarized as follows

-Removing foreign materials and short fibres
-Removing neps
-Straighten hooked fibres and fibre parallelism

The problems with combing process can be summarized as follows

-Uneven yarn quality due to faulty processes prior combing
-Uneven yarn quality due to faulty processes after combing
-Uneven yarn quality due to faulty processes of combing

Uneven yarn quality in combing can be summarized as follows
-High piecing fault which may lead to weak yarn and high unevenness
-Faulty functioning of combing elements which may lead to lower quality of combed yarn

Combing Noil % mainly depends upon the lap fibre properties . With this PC-program one can determine the minimum noil % to start the spin plan tests. In combing action long fibres are carried out with along short fibres therefore efficiency of combing action is determined by the % of long fibres in noil and % of short fibres after combing action. Any faulty functioning of combing elements could cause fibre breakage and hence uneven yarn quality.

1.3.1 Test Results of Proper Functioning of Combing Machine-Single Machine Data Report

Machine Number	**1**
Lot Number	A-25
Typeofcotton...	Ege
Test Date...	12.12.2017
Lap Weight	60,00
Count Delivered g/m	4,50
DetachingRollSetting..in mm	16,00
NoilMeasured	16,00
NoilCalculated	17,50
NumberOfDeliveries	1
NumberOfHeads	8
Minumum NoilStart With	7,74
Maximum Allowable Noil	21,10
Optimum Noil According.to Det.Set..	15,99
CombingPerformance	99,96
Total Mechanical Draft	88,00
Total Actual.Draft	89,60

Process	SLF1	SLF2	SFM %	LG	CVN
Comber Lap Back	29,18	15,98	2,22	23,25	33,14
Comber Lap Front	29,16	14,67	4,47	23,01	37,87
Sliver Back-L	31,15	16,78	1,69	24,76	34,06
Sliver Front-L	30,49	15,11	4,02	24,03	38,70
Comber Noil	24,00	7,00	17,86	19,26	55,74

Problem Analyses and Problem Solving

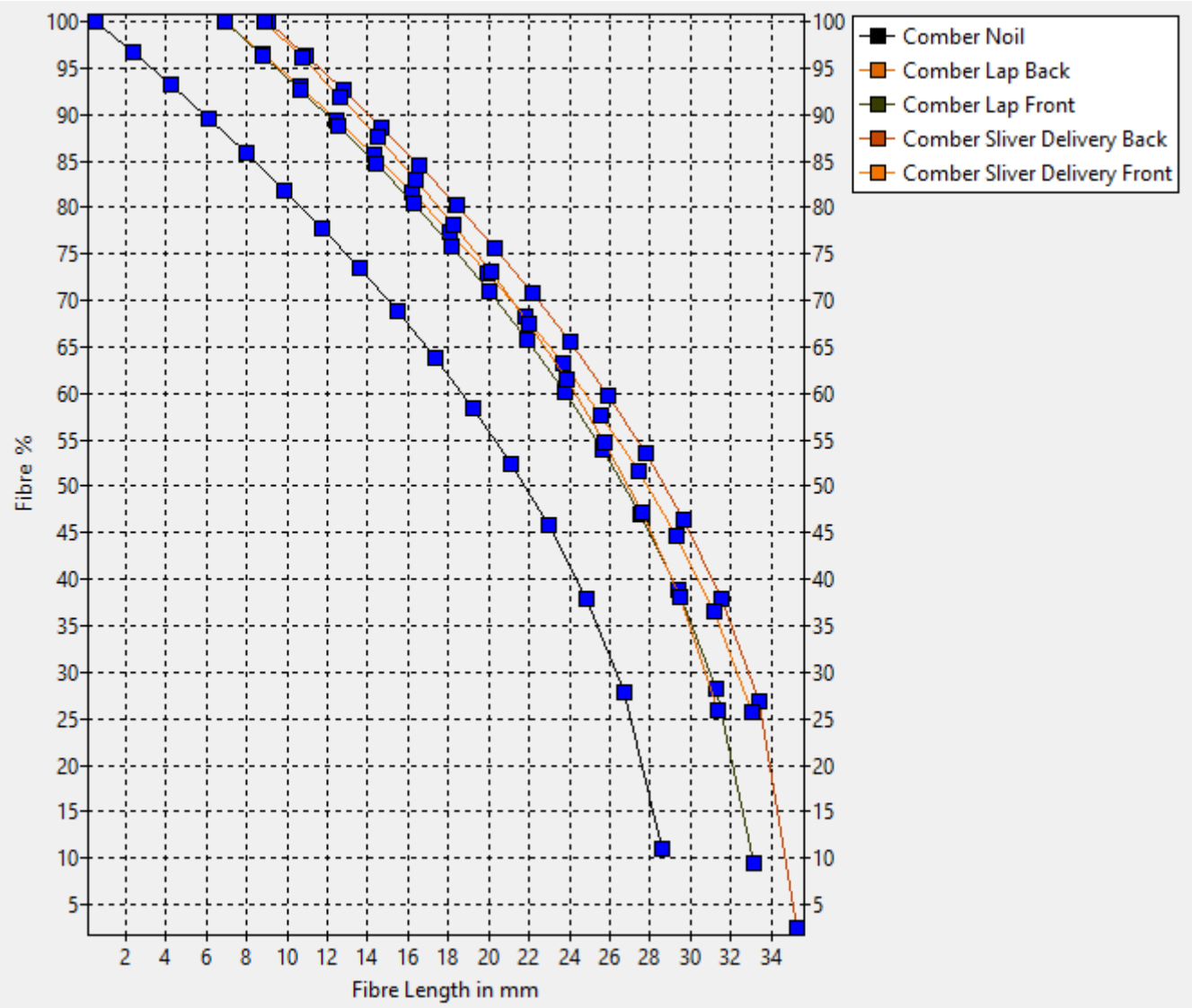
NIPPERS:Correct Setting
COMBING SEGMENT:Settings are in order

Top Comb:Top Comb Setting and Lap preparation is within acceptable limists

Variation lap feeding g/m and Combing Noil % within tolarances

Combing Noil % is normal - Check Fibre Length Distribution Charts

Fibre Weight Staple Curves Drawn from Itru Fibre Graph Readings



-Optimum Combing noil % according to detaching roller settings ,minimum and maximum combing noil % are determined according Fibre Weight Staple curves which are plotted from Itru Fibre Graph readings of 2,5 and 50 % Weighted Span Lengths. These readings are closely related to amount combing noil extraction. -Fibre weight staple diagrams of slivers and lap should be as parallel as possible to each other and not to cross each other -% of hook content is related the distance between the curves which is also related to fibre parallelism . If the distance is to close fibres may be too soft and very little friction due to excess removal of hooks and may cause problem in drafting and sliver breakage in roving .

Therefore check the fibre cohesion by hand or by an separate instrument .
The above chart is a good running combing machine of fibre weight staple curve.

1.3.2 Test Results of Faulty Functioning of Combing Machine

```
Machine Number.....:       1
Lot Number.........:    A-25
Typeofcotton... ...:     Ege
Test Date..... .....:12.12.2016
Lap Weight.........:   60,00
Count Delivered g/m.:    4,50
DetachingRollSetting..in mm.....:   16,00
NoilMeasured.......:   16,00
NoilCalculated.....:   17,50
NumberOfDeliveries.:       1
NumberOfHeads......:       8
Minumum NoilStart With.....:   12,52
Maximum Allowable Noil.....:   25,85
Optimum Noil According.to Det.Set..:   11,41
CombingPerformance.....:   63,37
Total Mechanical Draft.....:   88,00
Total Actual.Draft.....:   98,40
```

Process	SLF1	SLF2	SFM %	LG	CVN
Comber Lap Back	29,18	15,98	5,51	22,08	38,21
Comber Lap Front	29,16	14,67	5,69	22,82	40,15
Sliver Back-L	31,15	16,78	5,69	22,82	40,15
Sliver Front-L	30,49	15,11	3,53	22,24	34,37
Comber Noil	24,00	7,00	13,56	17,35	38,21

Problem Analyses and Problem Solving

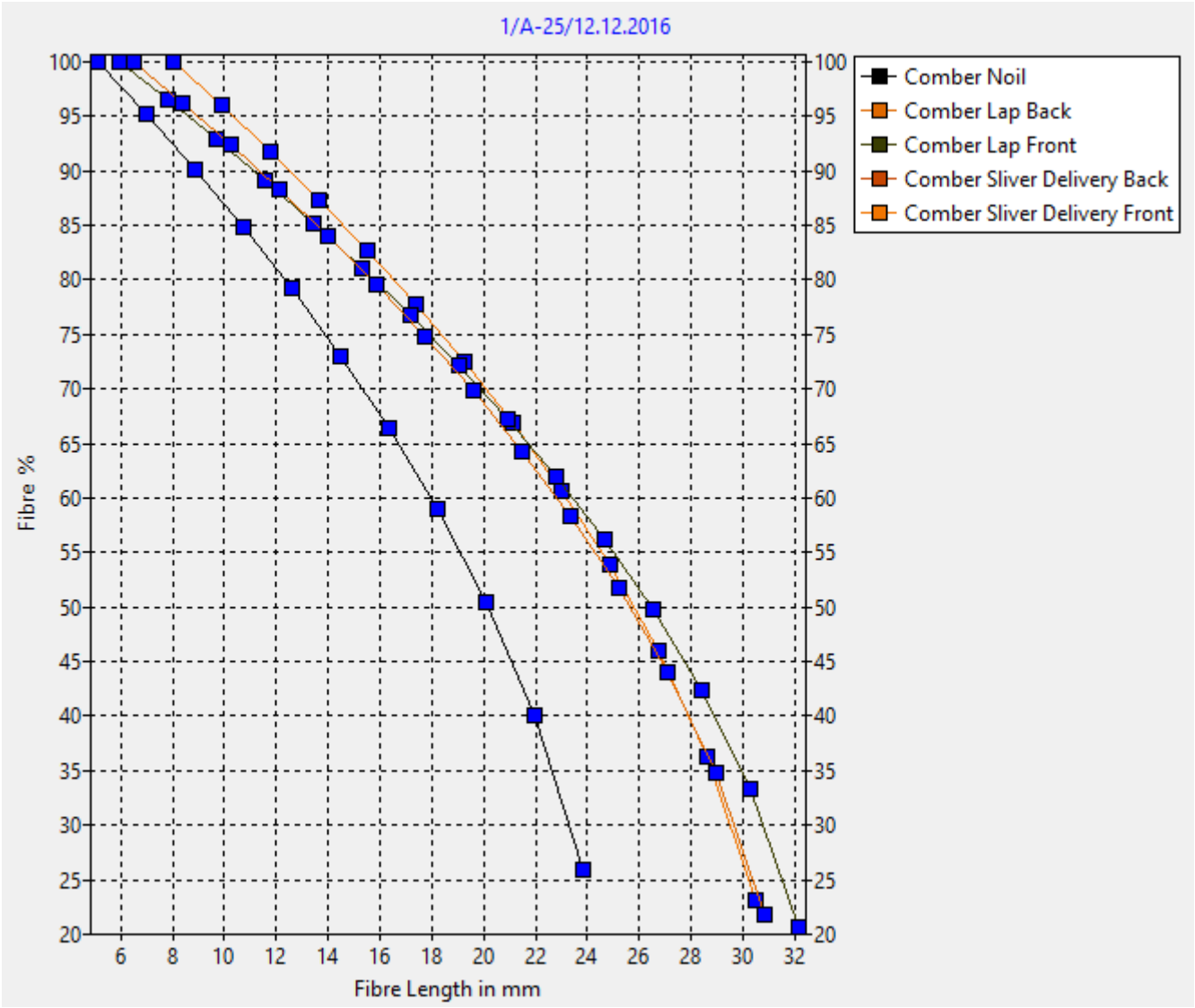
NIPPERS:Correct Setting
COMBING SEGMENT:Settings are in order

Top Comb:Setting is out of order :Check the timing index of top comb
:Check the Top Comb penetration distance
Lap :High content of trailing hooks:Check carding machine-Carry out Card Fibre Transfer Test
:Check card sliver,pre-comber drawframe and lap machine

There is lap weight g/m variation and noil % variation between combing heads
Carry out Combing Noil Test as instructed by Itru

Combing Noil % is normal - Check Fibre Length Distribution Charts

Fibre Breakage on leading hooks
Check Top Comb Setting
Check Back/Front Draft Zone Settings


1/A-25/12.12.2016
Comber Noil
Comber Lap Back
Comber Lap Front
Comber Sliver Delivery Back
Comber Sliver Delivery Front
Fibre %
Fibre Length in mm
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
6
8
10
12
14
16
18
20
22
24
26
28
30
32

1.4 Terms and Definitions

Item	Description
Machine No	Integer value
Lot no	Character
Type of Cotton	Type of cotton used
Lap G/M	Lap weight fed gram per meter
Sliver G/M	Sliver count delivered gram per meter
Detaching Roller Setting in mm	Setting distance between detaching roller-Nippers
Noil % Measured	% of combing noil measured
Calculated Noil %	% of combing noil computed
Number of deliveries	Number of delivery heads
Number of Laps feed	Number of feeding laps
Minimum Combing Noil to start %	Minimum combing noil % according to fibre length
Maximum Combing Noil to end %	Maximum combing noil % according to fibre length
Optimum Combing Noil % -Detaching Roll Setting	Optimum combing noil % according to the detaching roll setting
Combing Noil Performance %	Performance of combing cleaning efficiency
2,5 % Weighted Span Length of Lap Back	Itru Fibre Graph 2,5 Weighted Span Length in mm Trailing Side (Back)
2,5 % Weighted Span Length of Lap Front	Itru Fibre Graph 2,5 Weighted Span Length in mm Leading Side (Front)
2,5 % Weighted Span Length of Sliver Back	Itru Fibre Graph 2,5 % Weighted Span Length in mm
2,5 % Weighted Span Length of Sliver Front	
2,5 % Weighted Span Length of Noil	
50% Weighted Span Length of Lap Back	Itru Fibre Graph 50 % Weighted Span Length in mm
50% Weighted Span Length of Lap Front	
50% Weighted Span Length of Sliver Back	
50% Weighted Span Length of Sliver Front	
50% Weighted Span Length of Noil	
SFN % of Lap Back	Short fibre content by fibre number
SFN % of Lap Front	Short fibre content by fibre number
SFN % of Sliver Back	Short fibre content by fibre number
SFN % of Sliver Front	Short fibre content by fibre number
SFN % of Noil	
LG of Lap Back	Mean fibre length by fibre weight
LG of Lap Front	
LG of Sliver Back	
LG of Sliver Front	
LG of Noil	
CVN % of Lap Back	Coefficient of variation of fibre length by number
CVN % of Lap Front	Coefficient of variation of fibre length by number
CVN % of Sliver Back	Coefficient of variation of fibre length by number
CVN % of Sliver Front	Coefficient of variation of fibre length by number
CVN % of Noil	Coefficient of variation of fibre length by number
Top comb penetration in mm	Setting of top comb penetration distance in mm
Timing Index	Relative timing of combing elements
Combing segment setting	The clearance between combing segment and nippers
Lap feed mm per nips	Feed by lap roller mm per nips
Feed mm per nips	Feed by feed roller to comber in mm per nips

1.5 Analyses of Test Results

		Specifications
Machine No	1	
Lot no	Test 2	
Type of Cotton	Ege	1-1/8 in staple
Lap G/M	70	Production
Sliver G/M	4,92	Production and Draft
Detaching Roller Setting in mm	14,5	Noil %
Noil % Measured	13,2	Test
Calculated Noil %	13,02	Computed
Number of deliveries	1	
Number of Laps feed	8	
Minimum Combing Noil to start %	9,51	Lap fibre properties
Maximum Combing Noil to end %	21,46	Lap Fibre properties
Optimum Combing Noil % -Detaching Roll Setting	13,66	Combing Efficiency
Combing Machine Performance Index %	103,49	Efficiency of short fibre removal

Total Draft (Mechanical Draft) in combing depends upon Lap Gram per meter feed , % noil extraction and sliver delivery count .

Total Mechanical Draft is equal to delivery speed of coiler calender rollers (meter per minute) divided by lap feed roller delivery (meter per minute) and should be checked according to gearing diagram on the machine

If the calculated and computed noil % are close to each other then each feeding heads are functioning in similarity other wise there are variations between heads in terms of noil extraction and each head should be checked separately by **Combing Noil/Neps Poisson Analyses Test** as instructed by Itru Group Ltd.

For this specific test minimum noil % could be adjusted to 9,51 % and could be increased up to 21,46 % in considering the Combing Machine Performance Index which is equal to optimum combing noil % divided by actual combing noil %. If Combing Machine Performance Index value goes below 100 % during the test then there is no benefit of reducing or increasing the combing noil %. Increasing or decreasing combing noil % may cause fibre breakage and optimum combing noil must be determined from Combing Machine Performance Index value.

Test No	Test1	Test2	Test 3	Test4	Test5	Test6
Lot #	Ege	Ege	Ege	Ege	Ege	Ege
Lap G/M	70	70	70	70	70	70
Sliver G/M	4,92	4,92	4,92	4,92	4,92	4,92
Detaching Roller Setting in mm	14,9	14,5	14,25	13,9	13,6	13,3
% of Combing Noil Measured	14,2	13,2	12,1	11,2	10	9,4
% of Combing Noil Projected	13,9	13,02	12,14	11,26	10,39	9,51
Number of heads	1	1	1	1	1	1
Number of heads feed	8	8	8	8	8	8
Minimum % of noil setting	10,37	9,51	9,21	10,11	11,82	10,05
Maximum % of Noil setting	21,92	21,46	21,73	21,5	23,69	22
Optimum Noil % according to Detaching Roll setting	15,21	13,66	13	12,87	14,07	11,69
Combing Machine Running Performance Index	107,14	103,49	107,43	114,92	140,65	124,35
Process Optimization						

6 tests were carried out to optimize the combing noil % with the Comber Data Pc-Program and it can be seen that Test Number 5 which gives the highest Combing Machine Performance Index value so 10 % of combing noil is the optimum noil % for this type of Cotton Mix. So following chart should be plotted (Combing Machine Performance Index and Combing Noil (%).This procedure applies only when the machine functions properly and indicates no malfunction of the main combing elements. So combing Machine Performance Index can be taken as a KEY parameter in combing process.

In this example further reduction in combing noil % is possible down to 100 % Combing Performance Index Value.

Fibre Length Analyses

Process	% 2.5 SL1Y	% 50 SL2Y	% SFN	LG	% CVN
Lap Back	30,5	15,56	3,28	24,1	37,09
Lap Front	31,47	18,06	0,44	25,26	30,52
Sliver Back	30,63	16,08	2,51	24,27	35,5
Sliver Front	29,51	17,15	0,76	23,74	29,81
Noil	25,4	7,6	19,76	20,43	65,46

%SFN is % of short fibres by number less then 12 mm . SFN should reduce after combing in leading

and trailing sides of the sliver.

LG is mean fibre length by weight and should increase after combing In this case we see that there is a fibre breakage

Fibre Growth and Changes in Hook Direction			
Machine	***Hook Direction***		***Tests***
Card Sliver coiler calender exit	Front	Back	Itru Fibre Graph 2,5 and 50 Weighted Span Length
Card can Exit	Back	Front	
Pre-comber Draw Frame exit	Back	Front	Itru Fibre Graph 2,5 and 50 Weighted Span Length
Pre-comber Draw Frame Can	Front	Back	
Sliver Lap Exit	Front	Back	Itru Fibre Graph 2,5 and 50 Weighted Span Length
Lap delivery	Back	Front	Comber Data Measurement
Comber Sliver Coiler Exit	Back	Front	Comber Data Measurement
Combed Sliver From Can	Front	Back	Itru Fibre Graph 2,5 and 50 Weighted Span Length

Comber Sliver from Can back side is usually shorter than front side due to carding trailing hooks. The hooks after combing should be checked with **Spin Plan ver 1.0 Pc-Program.**

CVN % is a indication of coefficient of fibre length distribution by number. It can be seen that Lap Back CVN % value is 37 % and trailing hooks content is rather high . Now ,one should check the back process before combing i.e. lap machine and pre-comber draw frame and card.
Although some short fibres are removed (reduction in CV %) along with breakage of some long fibres indication of increase of SFN % . So this machine should be checked. And the following information is provided for the malfunctions :

```
Combing  Quality Performance
--------------
NIPPERS:Not correct setting      :Check the closing index time of nippers
       :Mechanical Fault         :Check the mechanical conditions of nippers on
all heads for scratches
LAP:High content of leading hooks :Check the lap preparation COMBING
SEGMENT:Not  correct  setting  :Check  the  clearance  of  combing
segment/nippers

               :Mechanical faults:Check the clothing on combing segment Top

Comb:Top  Comb  Setting  and  Lap  preparation  is  within  acceptable  limits

Variation lap feeding g/m   and Combing Noil % within tolerances
```

Combing Noil % is normal - Check Fibre Length Distribution Charts

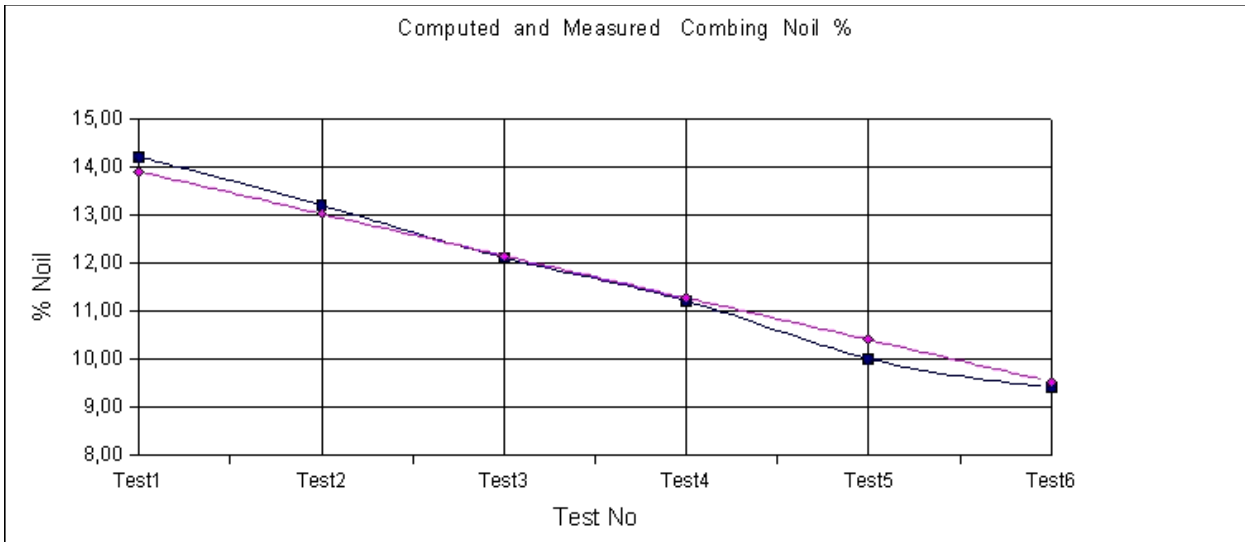
Fibre Breakage on leading hooks
Check Back/Front Draft Zone Settings

As mentioned before **Combing Noil/Neps Poisson Analyses Test** as instructed by Itru Group Ltd. should be conducted for this machine .

In order to have proper functioning of combing machine relative timing of nippers, top comb,combing segment and detaching roller should be adjusted to minimize the piecing defect and also increase the Combing Machine Performance Index Value So in this machine all these timing must be re-checked.

1.6 Percentage of Combing Noil % Measured and % of Combing Noil Computed

Test No	Test1	Test2	Test 3	Test4	Test5	Test6
Lot #	Ege	Ege	Ege	Ege	Ege	Ege
Lap G/M	70	70	70	70	70	70
Sliver G/M	4,92	4,92	4,92	4,92	4,92	4,92
Detaching Roller Setting in mm	14,9	14,5	14,25	13,9	13,6	13,3
% of Combing Noil Measured	14,2	13,2	12,1	11,2	10	9,4
% of Combing Noil Projected	13,9	13,02	12,14	11,26	10,39	9,51
Number of heads	1	1	1	1	1	1
Number of heads feed	8	8	8	8	8	8
Minimum % of noil setting	10,37	9,51	9,21	10,11	11,82	10,05
Maximum % of Noil setting	21,92	21,46	21,73	21,5	23,69	22
Optimum Noil % according to Detaching Roll setting	15,21	13,66	13	12,87	14,07	11,69
Combing Machine Running Performance Index	107,14	103,49	107,43	114,92	140,65	124,35



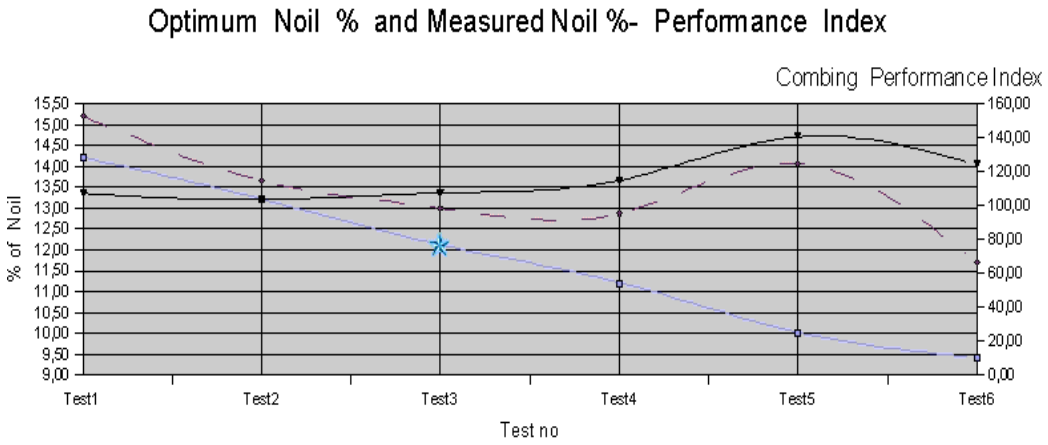
When the computed and measured noil % are close to each other then one can conclude following results.

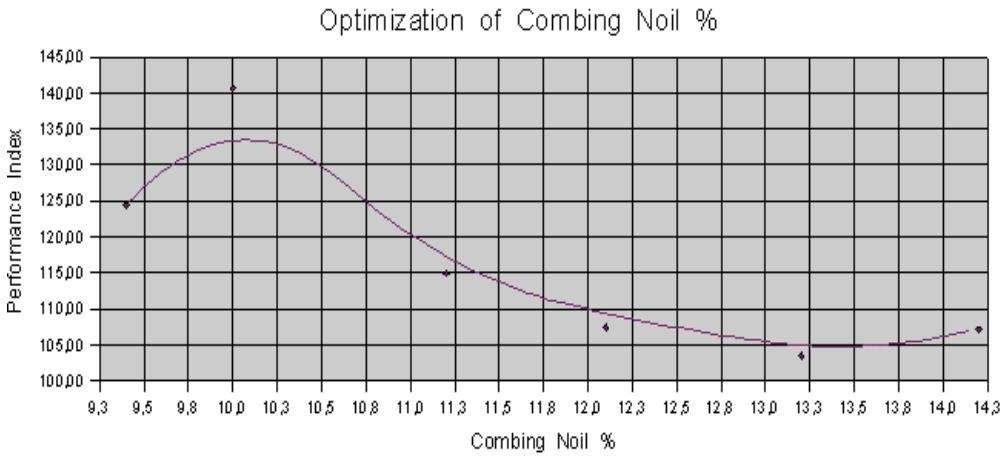
- **-Lap weight gram per meter variations are in acceptable range**
- **-Variation between combing heads noil % are within tolerances**

If the variation is high then both should be checked in regard to tests as instructed in Process /Quality control tests in Knowledge Based Quality Management Systems . It is also better to carry out Noil/Neps Poisson's Analyses Test .

The tests carried out above show that measured and computed noil % are in good agreement with each other.

As described before Optimization of Noil % depends upon the Combing Machine Performance Index . In this case Test Number 5 is the optimum noil % for the among 6 tests since it gives the highest Combing Machine Performance Index.





2.0 Process Optimization with Comber Data Pc-Program

Optimum Combing Noil % is determined by Comber Data PC-Program according to Lap fibre length properties and efficiency of combing machine. The usual procedure as follows :

- Check the functioning of combing elements with comber data PC-program and correct any faulty running item or setting according to existing detaching roller setting (noil % setting)

- Make at least ten measurement of for the above tests and make use of the average values. Since there are most of the time variation Lap fibre properties.

- If there is an high variation in Lap fibre properties then check the Fibre Growth Curve from blend to card and card to lap and take necessary measures to eliminate the fibre breakage and also high neps content . Card Fibre Transfer Test would be very useful to eliminate the fibre breakage and formation of neps.

- When Test 4 is carried out properly repeat the test Number 1 and find out the Combing Machine Performance Index value . If this value is above 125 than machine is running in order . And start making tests as above to reduce combing noil down to minimum combing noil to start with value and make yarn of at least 20 spinning cops.
  You may get good evenness values but increasing neps. Then you have to check immature fibres in blend i.e. dead fibres . They should be cleaned in carding . Check the card setting and carry out Card Fibre Transfer Test to minimize neps in carding .

- Carry out Spin Plan Tests with the help of Spin Matrix PC-Program to optimize yarn quality and production volumes from Comber to Ring Frames.

- Neps could be reduced by Technical Data/Machine Settings from Comber to Ring Frames with the aid of Spin Matrix PC-Program and Spin Plan PC-Program

- When you have achieved optimum yarn quality then you can further improve the fibre properties before lap preparation and reduce down to comber noil 6-8 % range and achieve similar yarn quality. In this case you have to repeat the tests from 5 to 7

3. Optimization of Combing Noil according to Cotton Mix

There are mainly 5 class of cotton types

-Very short
-Short
-Medium
-Long
-Extra Long

Depending upon the Fibre Strength all these five classes could be combed according to Lap fibre properties. As the fibre length reduces combing noil % should increase. With Long fibres staring noil % could be reduced to 6-7 % . Medium Staple cotton starting noil % could be 8-9 %. Fibre strength plays the most significant in terms of yarn strength with the same fibre length properties.

With the aid of Comber Data PC-Program Minimum and Maximum Noil % could be determined from between these values Process Optimization Tests are carried out to optimize the noil % and as well as yarn quality parameters.

For every lap fibre properties there are following calculations are available

Detaching Roller Setting in mm	14,5
Noil % Measured	13,2
Calculated Noil %	13,02
Number of deliveries	1
Number of Laps feed	8
Minimum Combing Noil to start %	9,51
Maximum Combing Noil to end %	21,46
Optimum Combing Noil % -Detaching Roll Setting	13,66
Combing Machine Performance %	103,49

- According to lap fibre properties from the PC-Program Minimum and Maximum allowable noil % are determined.

- According to minimum noil percentage noil % setting (detaching roller setting) is set on the machine.

- Noil % test and Comber Data PC-Program test are carried out according to new settings If the combing machine Performance Index is above 100 % then machine is removing short fibres effectively and Yarn Quality Improvement Tests are carried out. If the machine Performance Index Value is below 100 % then you must check the combing machine main items. In any case of test one must achieve less measured noil percentage then Optimum Noil % -Detaching Roll setting value.

- If the calculated and computed values are far from each other then each head of combing machine must be checked separately in terms of fibre properties and neps.

3.1 Spin Plan Tests for Combed Cotton to improve yarn quality and reduce combing Noil %

Spin Plan Tests after combing are carried out with Spin Plan ver 1.0 Pc-Program and Spin Matrix ver 1.0 Pc-Program to improve combed yarn quality and increase production volumes from comber to ring frames .

For the detailed information refer to Spin Plan Pc-Program Application report.

3.2 Technical Data Machine Settings to Improve Piecing Faults

When the spinning Mill Data Bank system has been established in the mill then one can carry out Technical Data /Machine Settings for further adjustment of the combing machine and subsequent processes aided by Spin Matrix ver 1.0 Pc- Program.

Material 100% cotton 1-1/8 in staple -Turkish Izmir Cotton

		Nominal Count	Neac	NeCV%	Dbl	Tpi	Tpiact	TpiCV%	U%	CV%	Thin	Thick	Neps	H	RKM	MinRKM	RKMCV%	E%	ECV%
Combed Noil %	Yarn	30	30,7	2,38		19,8	20,40	2,53	11,68	14,76	12	93	77	6,25	14,49	13,31	11,14	5,02	7,69
15	CV%		2,38				2,53		1,57	1,56	34,9	18,60	20,10	4,87	1,14			7,69	
	std		0,73				0,52		0,18	0,23	4,19	17,30	15,48	0,30	1,62			0,39	
	Q95		1,08						0,09	0,11	2	8	7	0,15	0,03			0,01	
10	Yarn	30	31	1,17		19,8	19,90	2,56	11,57	14,60	10	74	39	5,3	14,34	13,41	10,22	4,41	9,87
	CV%		1,17				2,56		1,83	1,89	49,7	17,40	20,10	2,30	10,22			9,87	
	std		0,36				0,51		0,21	0,28	4,97	12,88	7,84	0,12	1,46			0,44	
	Q95%								0,09	0,11	2	5	3	0,05	0,03			0,01	
T-test			1,646				3,083		1,756	1,991	1,376	3,940	9,795	12,958	0,308			4,640	
Significant Control			Non				Yes		Non	Non	Non	Yes	Yes	Yes	Non			Yes	
Result			Non				Non		Non	Non	Non	+ve	+ve	+ve	Non			-ve	

Combing noil first reduced from 18 % to 15 % then to 10% with over all improved yarn quality . Further reduction is also possible depending upon the material , machinery and yarn processing

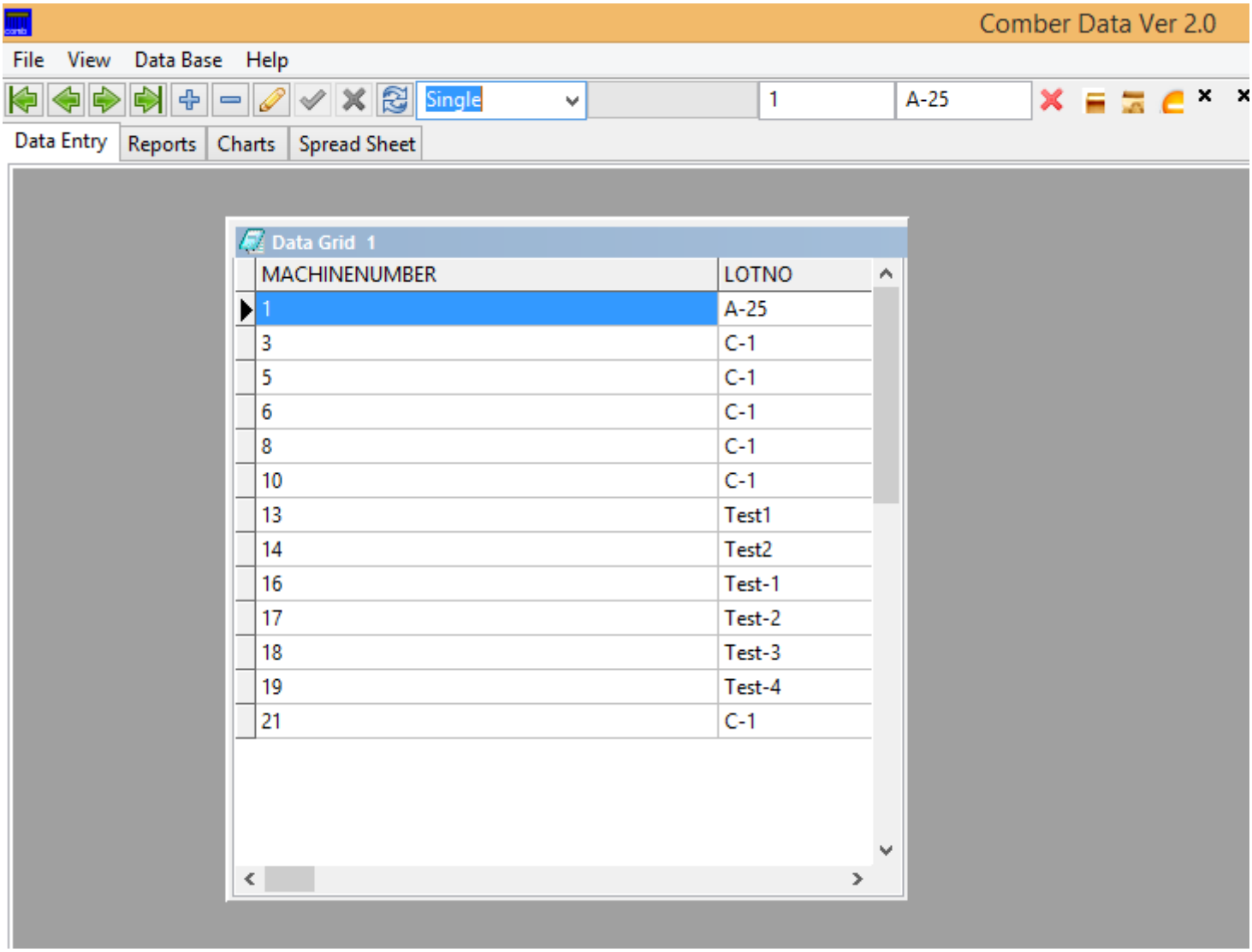
parameters . Through

- Technical data machine settings/Spinning Mill Data Bank PC-programs from carding to Ring Frames application
- Spin plan PC-program application
- Spin matrix PC-program application
- Comber data PC-program application above mentioned results were achieved including increasing production from carding,drawing and roving.

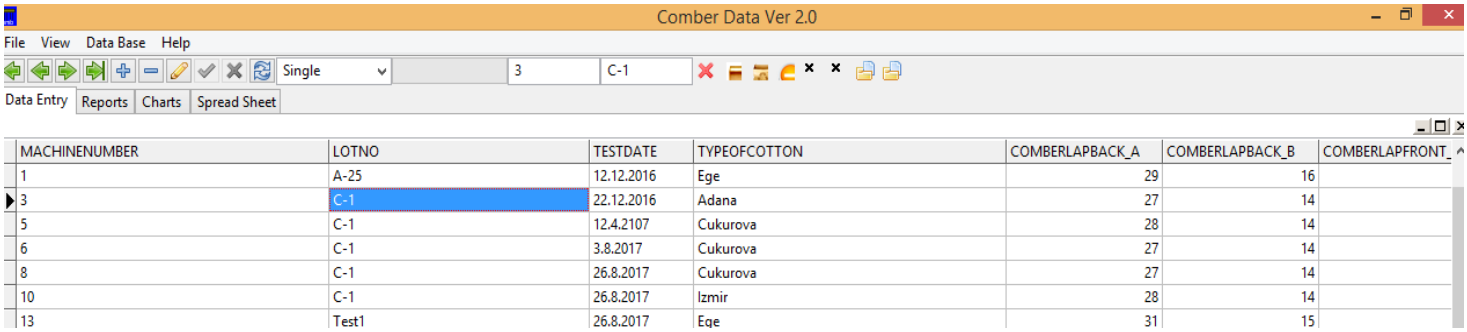
Better results were achieved with combed cotton /mmf fibres blends. Repeated tests also has given similar results.

4 Pc-program Outputs

4.1 Machine Card Index



Machine Card Index Data depends upon type of delivery(single or double) . Insert Button (+) copies to records that are added. If you have single delivery then use Filter Combobox as Single Delivery. And edit data accordingly. If you double click on the Data Grid you maximize the window.



New-Adds a new record to the data base

Add-Adds a selected record to the data base.

Edit-Edits selected record in the data base.

Delete-Deletes selected record from the data base.

Load DBF loads data base table Default table comber.dbf

Save DBF saves data base table

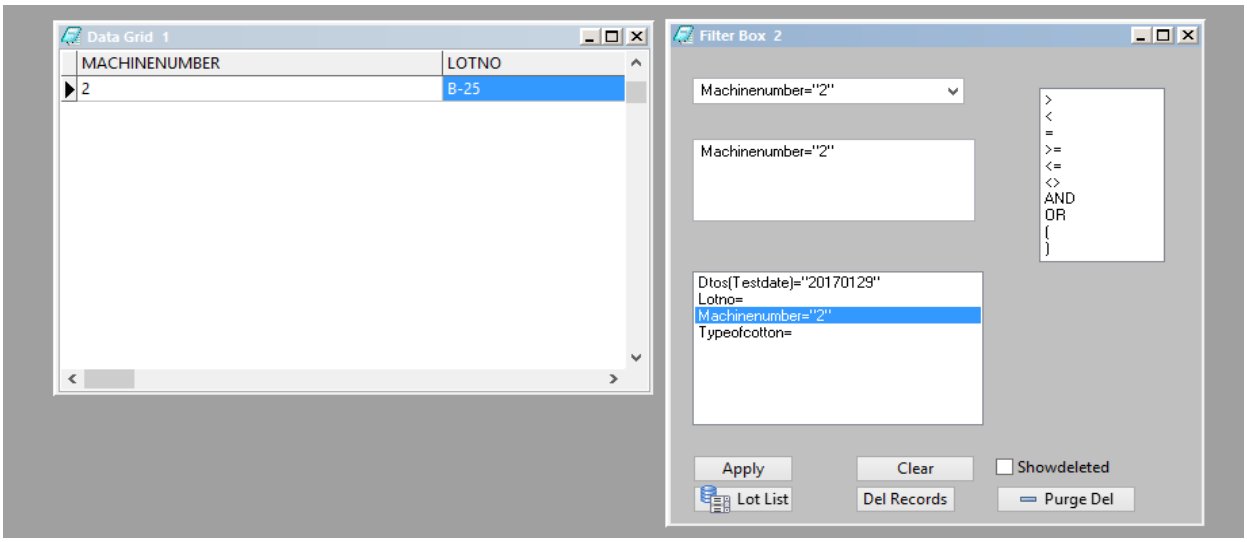
Pack Table Purge Deleted : Removes the Deleted the deleted records from the database

Delete :Deletes the records on the grid. Therefore be careful

Empty : Clears the table

Apply : Filter the records according to database parameters.

Lotlist : Make lists for date,lot,machine type and date.



With filter box you can filter records Apply button applies filtering command such Machine No=”1”

and Lotno=’A-25’ filters the records with Machine no=1 and Lotno=A-25

Insert (+) command copies the selected record. Use the same date of record when copying otherwise you will damage the date base. . If there is a holiday change the date time from computer so that correct date is entered.

There are also many filtering logic are available i.e and ,or , >>, <= ,(,) <> etc. . One can use any combinations of these

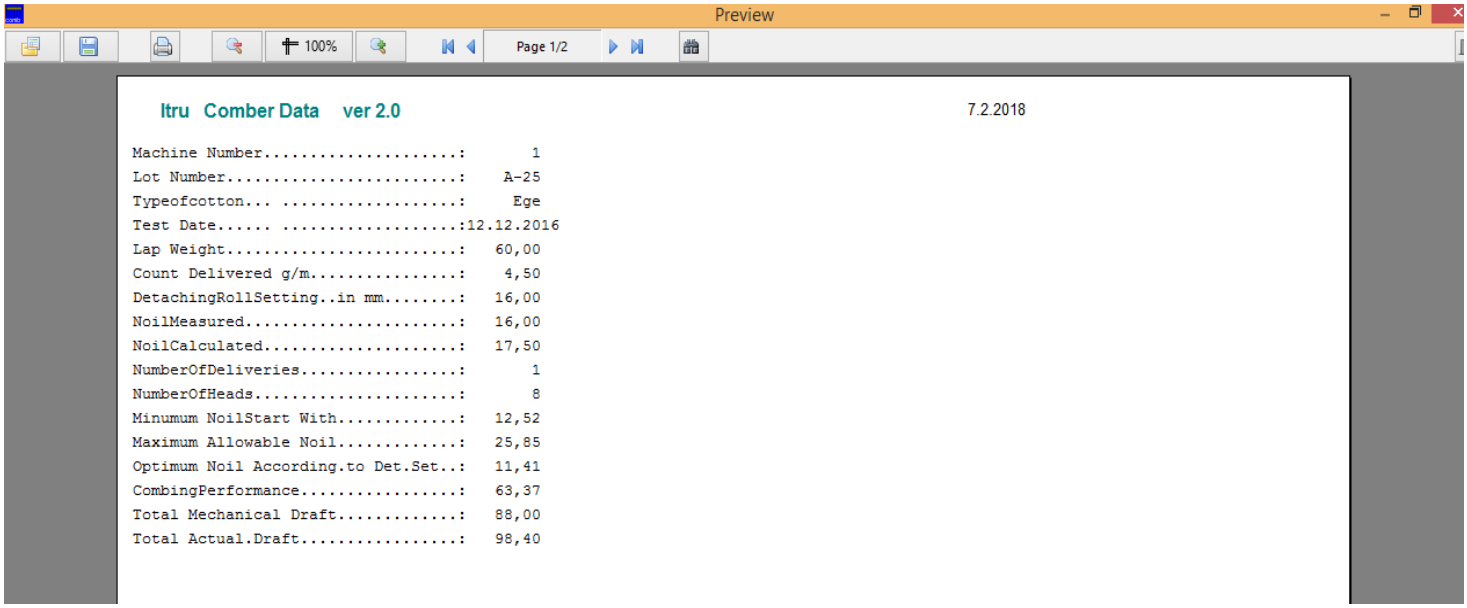
5 File Manager and Reports

5.1. Single Report and Printing

```
Machine Number.....................:       1
Lot Number.........................:    A-25
Typeofcotton... ...................:     Ege
Test Date..... ....................:12.12.2016
Lap Weight.........................:   60,00
Count Delivered g/m................:    4,50
DetachingRollSetting..in mm........:   16,00
NoilMeasured.......................:   16,00
NoilCalculated.....................:   17,50
NumberOfDeliveries.................:       1
NumberOfHeads......................:       8
Minumum NoilStart With.............:   12,52
Maximum Allowable Noil.............:   25,85
Optimum Noil According.to Det.Set..:   11,41
CombingPerformance.................:   63,37
Total Mechanical Draft.............:   88,00
Total Actual.Draft.................:   98,40
```

Process	SLF1	SLF2	SFM %	LG	CVN
Comber Lap Back	29,18	15,98	5,51	22,08	38,21
Comber Lap Front	29,16	14,67	5,69	22,82	40,15
Sliver Back-L	31,15	16,78	5,69	22,82	40,15
Sliver Front-L	30,49	15,11	3,53	22,24	34,37
Comber Noil	24,00	7,00	13,56	17,35	38,21

```
Problem Analyses and Problem Solving

NIPPERS:Correct Setting
COMBING SEGMENT:Settings are in order

Top Comb:Setting is out of order  :Check the timing index  of top comb
                                  :Check the Top Comb penetration distance
Lap     :High content of trailing hooks:Check carding machine-Carry out Card Fibre Transfer
Test
                                        :Check card sliver,pre-comber drawframe and lap
machine

There is  lap weight g/m variation and noil % variation between combing heads
Carry  out  Combing Noil Test as instructed by Itru

Combing Noil % is normal - Check Fibre Length Distribution Charts

Fibre Breakage on leading hooks
Check Top Comb Setting
Check Back/Front Draft Zone Settings
```



5.2 Summary Reports

a) Select Filtering box then press Apply button

b) Press File Manager button after these one can get the functions of items shown below:

Reports are given

1) Summary
2) Lot
3) Type of Cotton
4) Lot Sum
5) Type of Cotton Sum
6) Lot and Type of Cotton
7) Lot and Type of Cotton Summary
8) Test Date List
9) Test Date Summary

Machine no	Lot no	Type of Cot	Test date	Del	Min Noil	OptNoil	MaxNoil	NoilCal	NoilAct	Lap G/m	Del g/m	TMec D	Perform%
1:	A-25:	Ege:	12.12.2016:	1:	7,74:	15,99:	21,10:	17,50:	16,00:	60,00:	4,50:	88,00:	99,96
2:	B-25:	Ege:	27.8.2017:	2:	11,67:	8,50:	24,42:	23,08:	21,00:	65,00:	5,00:	40,00:	40,48
3:	C-1:	Adana:	22.12.2016:	1:	12,87:	11,70:	26,98:	12,50:	12,00:	75,00:	5,00:	105,00:	97,54
4:	D-1:	Cukurova:	27.8.2017:	2:	13,16:	11,99:	27,19:	13,33:	12,00:	75,00:	5,00:	52,00:	99,94
5:	C-1:	Cukurova:	12.4.2107:	1:	12,52:	11,41:	25,85:	17,50:	18,00:	75,00:	5,00:	99,00:	63,37
6:	C-1:	Cukurova:	3.8.2017:	1:	13,16:	11,99:	27,19:	12,50:	12,00:	75,00:	5,00:	105,00:	99,94
7:	C-1:	Adana:	27.8.2017:	2:	12,87:	11,70:	26,98:	13,33:	12,00:	75,00:	5,00:	52,00:	97,54
8:	C-1:	Cukurova:	26.8.2017:	1:	13,16:	11,99:	27,19:	12,50:	12,00:	75,00:	5,00:	105,00:	99,94
9:	B-25:	Cukurova:	29.9.2017:	2:	11,67:	8,50:	24,42:	23,08:	21,00:	65,00:	5,00:	40,00:	40,48
10:	C-1:	Izmir:	26.8.2017:	1:	12,52:	11,41:	25,85:	17,50:	18,00:	75,00:	5,00:	99,00:	63,37
11:	C-1:	Cukurova:	29.9.2017:	2:	12,87:	11,70:	26,98:	13,33:	12,00:	75,00:	5,00:	52,00:	97,54
12:	B-25:	Cukurova:	29.9.2017:	2:	11,67:	8,50:	24,42:	23,08:	21,00:	65,00:	5,00:	40,00:	40,48
13:	Test1:	Ege:	26.8.2017:	1:	10,37:	15,21:	21,92:	13,90:	14,20:	70,00:	4,92:	98,00:	107,14
14:	Test2:	Ege:	26.8.2017:	1:	9,49:	13,65:	21,47:	13,90:	13,20:	70,00:	4,92:	98,00:	103,43
15:	Test2:	Urfa:	29.9.2017:	2:	7,84:	11,27:	17,60:	13,90:	13,20:	70,00:	4,92:	49,00:	85,35
16:	Test-1:	Ege:	27.8.2017:	1:	7,57:	12,73:	19,89:	18,33:	14,40:	75,00:	5,00:	98,00:	88,41
17:	Test-2:	Ege:	27.8.2017:	1:	7,57:	12,73:	19,89:	16,84:	14,70:	75,00:	5,67:	88,00:	86,61
18:	Test-3:	Ege:	27.8.2017:	1:	7,57:	12,73:	19,89:	14,50:	14,50:	75,00:	4,50:	114,00:	87,80
19:	Test-4:	Ege:	28.8.2017:	1:	7,57:	12,73:	19,89:	15,67:	13,70:	75,00:	4,40:	115,00:	92,93
20:	B-25:	Cukurova:	2.11.2017:	2:	11,67:	8,50:	24,42:	23,08:	21,00:	65,00:	5,00:	40,00:	40,48
21:	C-1:	Cukurova:	29.8.2017:	1:	12,52:	23,25:	25,85:	18,33:	18,00:	75,00:	5,00:	98,00:	129,19
Mean:	........:	........:	........:	........:	10,86:	12,30:	23,78:	16,56:	15,42:	71,67:	4,94:	79,76:	83,90
Min:	........:	........:	........:	........:	7,57:	8,50:	17,60:	12,50:	12,00:	60,00:	4,40:	40,00:	40,48
Max:	........:	........:	........:	........:	13,16:	23,25:	27,19:	23,08:	21,00:	75,00:	5,67:	115,00:	129,19

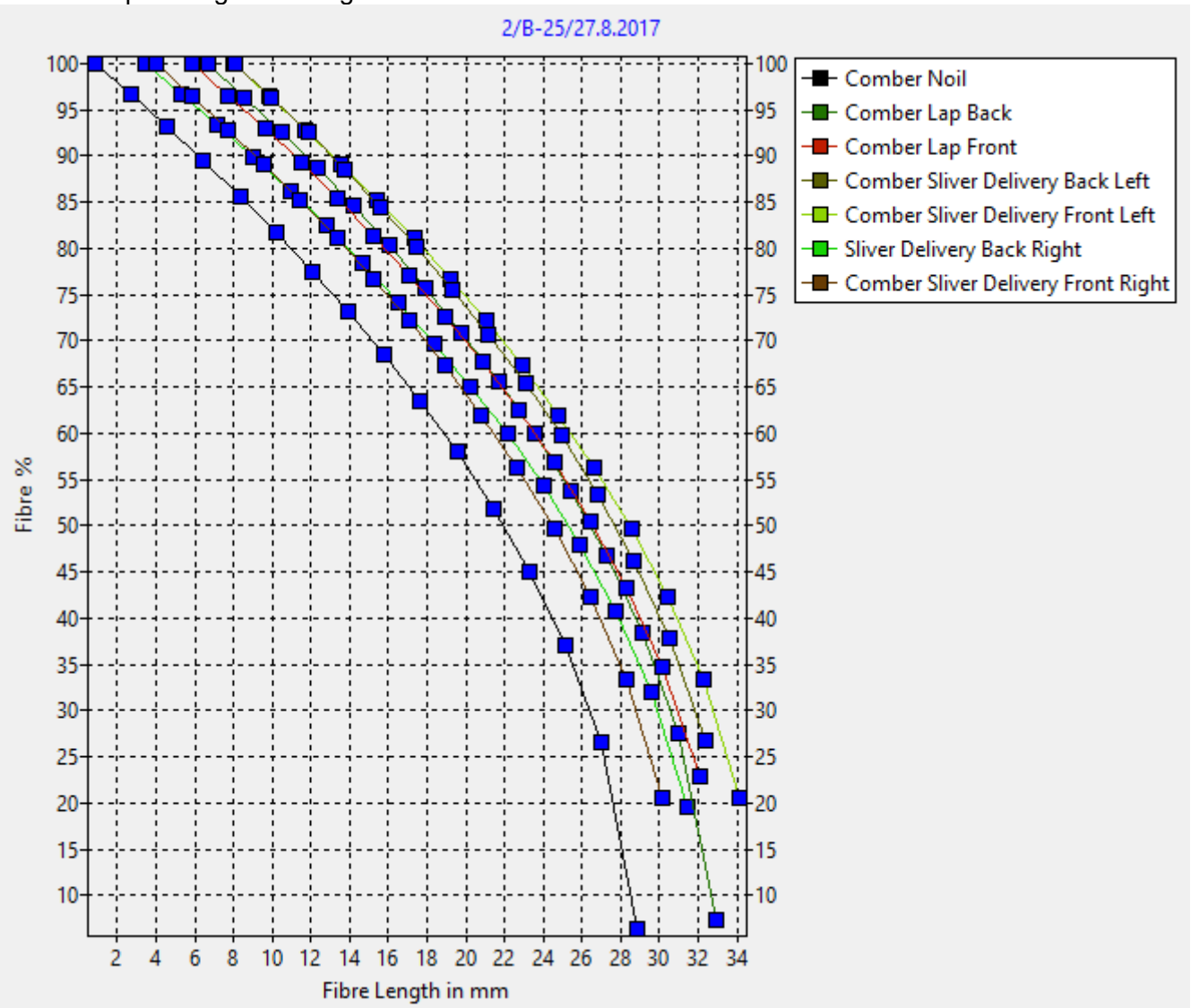
6 Pc-program Outputs and How to use the pc-program

Spinning Geometry has effects upon end break rate and yarn quality and production levels. Out of production hours depends upon spinning cops weight which in turn depends on packing density.

Check full spinning cops end measure the cops formation parameters as related to the program and compare the data in the program and correct accordingly.

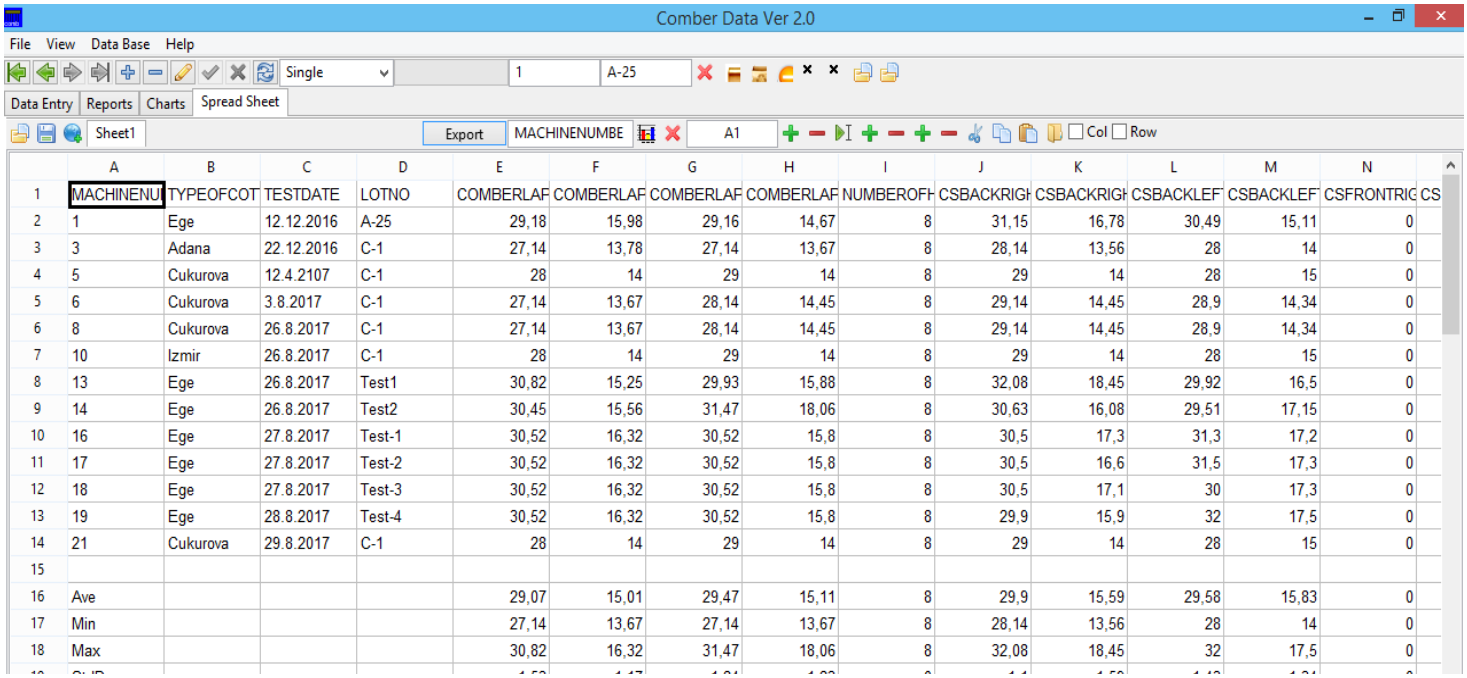
6.1 Charts

Fibre Mass Staple Diagrams Single and Double Deliveries



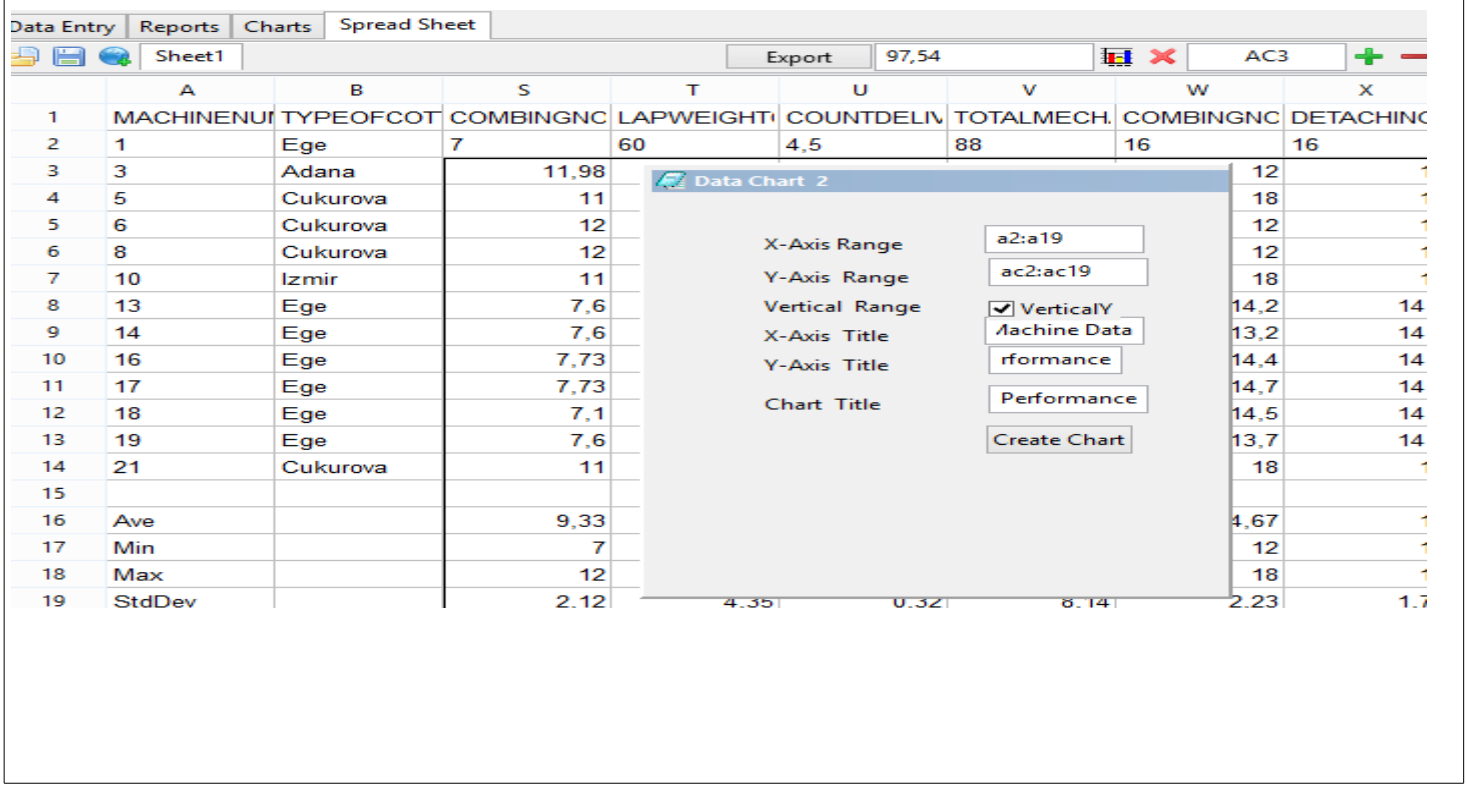
6.2 Spread Sheet and Spread Sheet Charts

Press Export Button to export calculated database to spread sheet.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	MACHINENU	TYPEOFCOT	TESTDATE	LOTNO	COMBERLAF	COMBERLAF	COMBERLAF	COMBERLAF	NUMBEROFH	CSBACKRIGH	CSBACKRIGH	CSBACKLEF	CSBACKLEF	CSFRONTRIG
2	1	Ege	12.12.2016	A-25	29,18	15,98	29,16	14,67	8	31,15	16,78	30,49	15,11	0
3	3	Adana	22.12.2016	C-1	27,14	13,78	27,14	13,67	8	28,14	13,56	28	14	0
4	5	Cukurova	12.4.2107	C-1	28	14	29	14	8	29	14	28	15	0
5	6	Cukurova	3.8.2017	C-1	27,14	13,67	28,14	14,45	8	29,14	14,45	28,9	14,34	0
6	8	Cukurova	26.8.2017	C-1	27,14	13,67	28,14	14,45	8	29,14	14,45	28,9	14,34	0
7	10	Izmir	26.8.2017	C-1	28	14	29	14	8	29	14	28	15	0
8	13	Ege	26.8.2017	Test1	30,82	15,25	29,93	15,88	8	32,08	18,45	29,92	16,5	0
9	14	Ege	26.8.2017	Test2	30,45	15,56	31,47	18,06	8	30,63	16,08	29,51	17,15	0
10	16	Ege	27.8.2017	Test-1	30,52	16,32	30,52	15,8	8	30,5	17,3	31,3	17,2	0
11	17	Ege	27.8.2017	Test-2	30,52	16,32	30,52	15,8	8	30,5	16,6	31,5	17,3	0
12	18	Ege	27.8.2017	Test-3	30,52	16,32	30,52	15,8	8	30,5	17,1	30	17,3	0
13	19	Ege	28.8.2017	Test-4	30,52	16,32	30,52	15,8	8	29,9	15,9	32	17,5	0
14	21	Cukurova	29.8.2017	C-1	28	14	29	14	8	29	14	28	15	0
15														
16	Ave				29,07	15,01	29,47	15,11	8	29,9	15,59	29,58	15,83	0
17	Min				27,14	13,67	27,14	13,67	8	28,14	13,56	28	14	0
18	Max				30,82	16,32	31,47	18,06	8	32,08	18,45	32	17,5	0

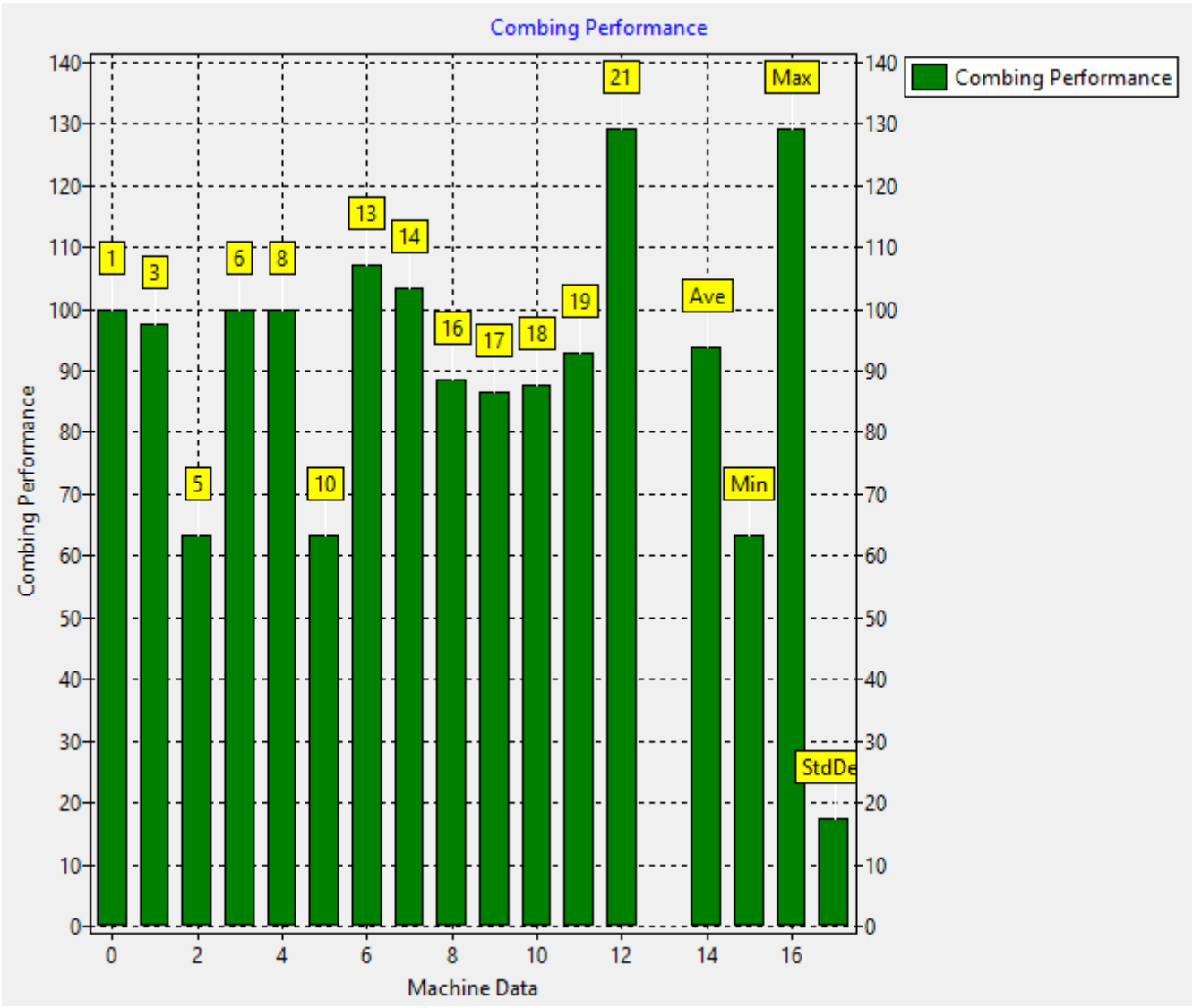
Spread Sheet Chart



	A	B	S	T	U	V	W	X
1	MACHINENUI	TYPEOFCOT	COMBINGNC	LAPWEIGHT	COUNTDELIV	TOTALMECH.	COMBINGNC	DETACHING
2	1	Ege	7	60	4,5	88	16	16
3	3	Adana	11,98				12	
4	5	Cukurova	11				18	
5	6	Cukurova	12				12	
6	8	Cukurova	12				12	
7	10	Izmir	11				18	
8	13	Ege	7,6				14,2	14
9	14	Ege	7,6				13,2	14
10	16	Ege	7,73				14,4	14
11	17	Ege	7,73				14,7	14
12	18	Ege	7,1				14,5	14
13	19	Ege	7,6				13,7	14
14	21	Cukurova	11				18	
15								
16	Ave		9,33				4,67	
17	Min		7				12	
18	Max		12				18	
19	StdDev		2,12	4,35	0,32	8,14	2,23	1,7

Compare these with end break rates and optimise spindle rpm

Combing Performance



One can plot more than 20 charts from the spread sheet .

7 Practical Procedures for Applications of Comber Data ver 2.0 Pc-Program

In order to have full functional benefits of the Pc-Programs

a) All the machine settings in relation to lap formation and lap weight and size should be checked

b) All the combing noils for each head should be measured and compared with each other

c) All the can sliver formation and size for each machine should be measured

d) Combing Sliver 2,5 and 50 % Span Lengths should measured to and fro

d) Lap Count Gram per meter should be measured for at least five readings.

e) All the machine nipper speed rpm and deli delivery of front rollers should be measured

and corrective measures should be taken to check the machine main motors.

f) Top comb penetration distance and nippers forward measurement distance should be measured by placing a paper under nippers rollers Back forward linear distance.