Seasonal Changes in the Mill and how to reduce Efficiency Loss

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Impacts of season changes to the milling system

Temperature changes:

– Water absorption of the wheat

– Moisture loss in the mill

– Condensation issues

– Frozen wheat

– Roll temperatures (expansion)

Humidity Changes:

– Moisture loss in the mill

– Sifting efficiency

– Flowability of products

– Condensation issues

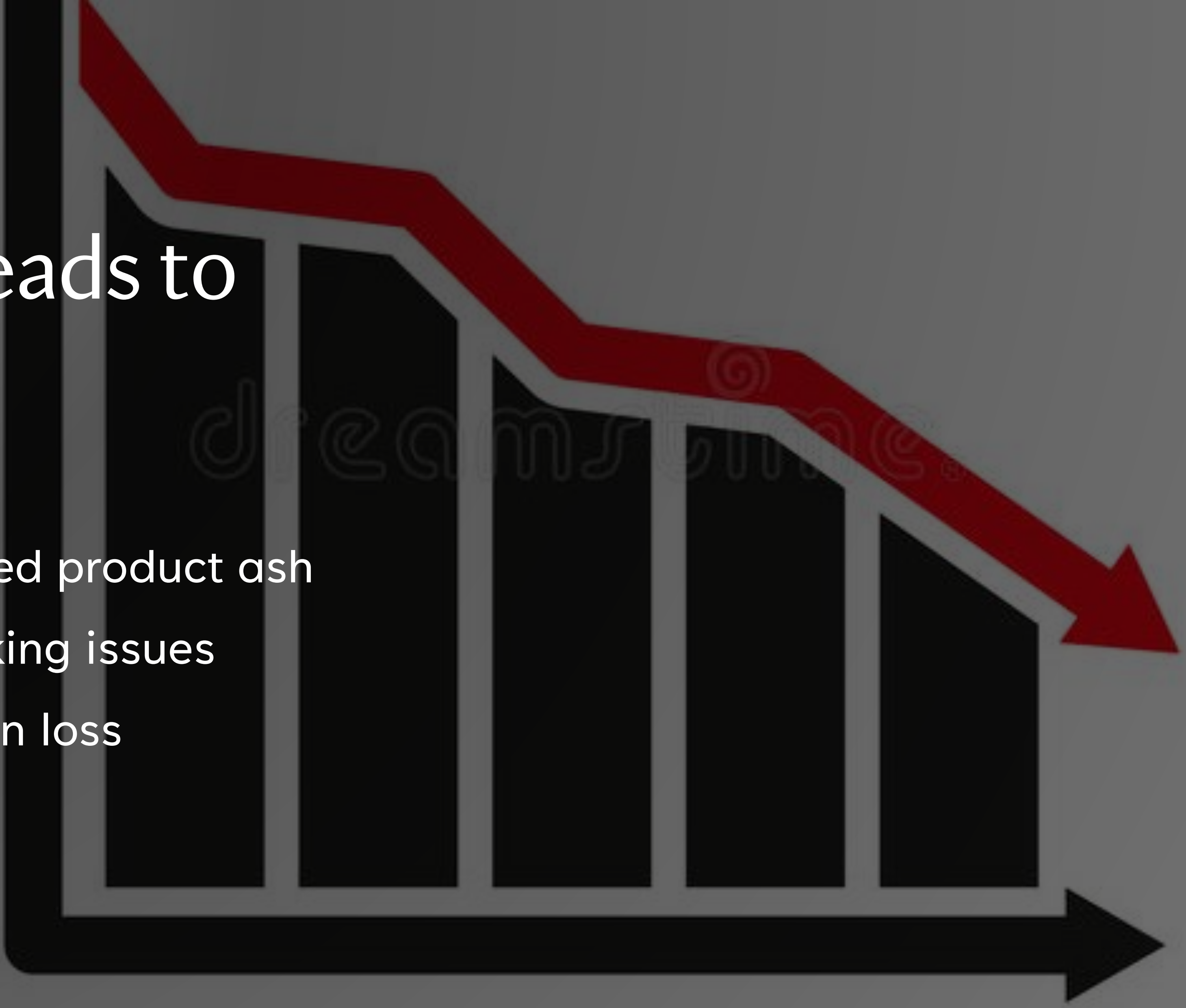
– Bran dusting efficiency

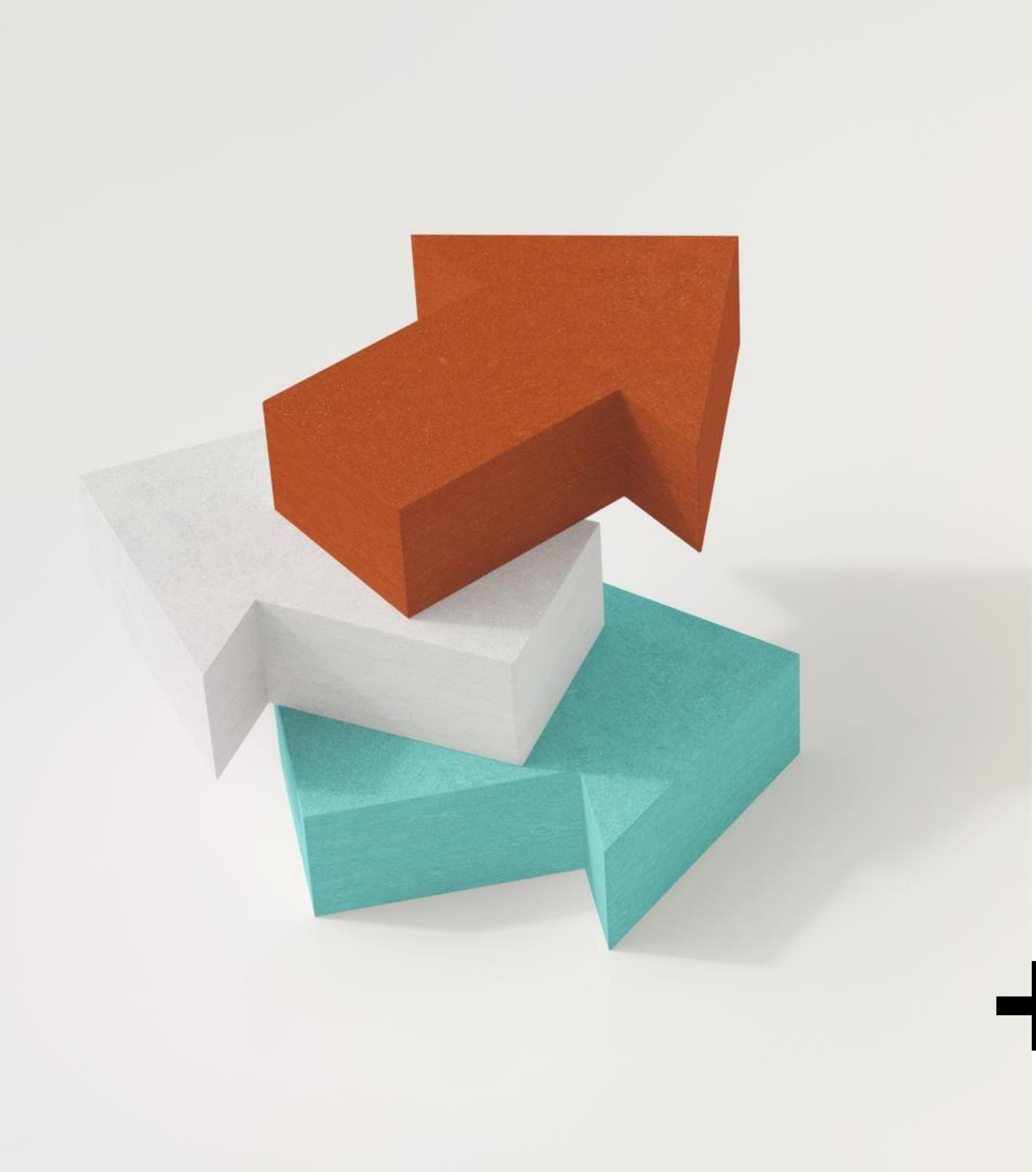
– Purifier efficiency

– Grinding efficiency

All this leads to

– Lower Yields
– Higher finished product ash
– Potential baking issues
– Higher protein loss

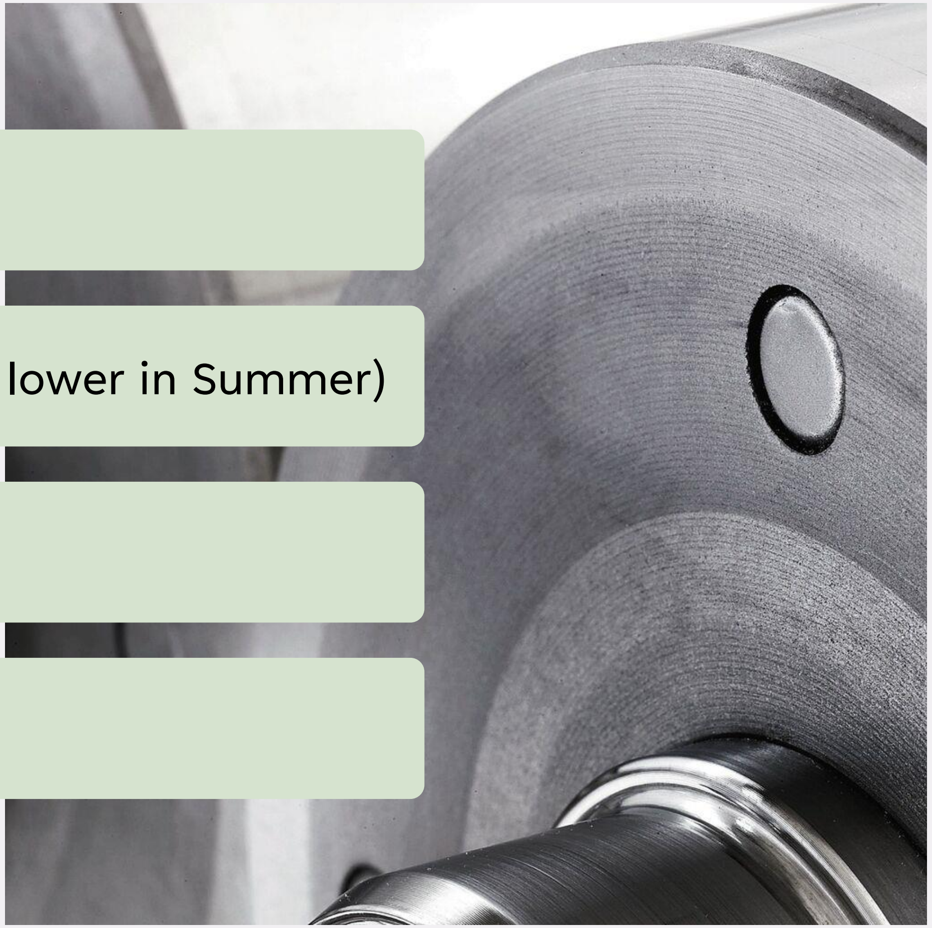




Reducing or preventing Efficiency Loss

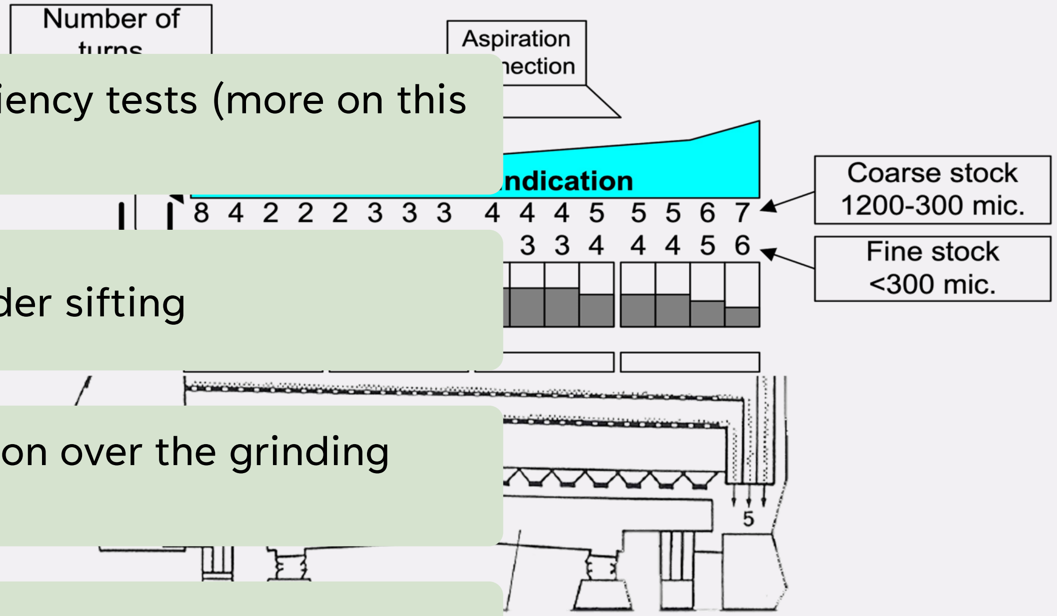
Actions to reduce Seasonal impact

- Are we adding the correct amount of water?
- Should temper times be adjusted? (higher in winter, lower in Summer)
- Are we using the correct break release?
- Are the rolls in a good condition?



Actions to reduce Seasonal impact continued

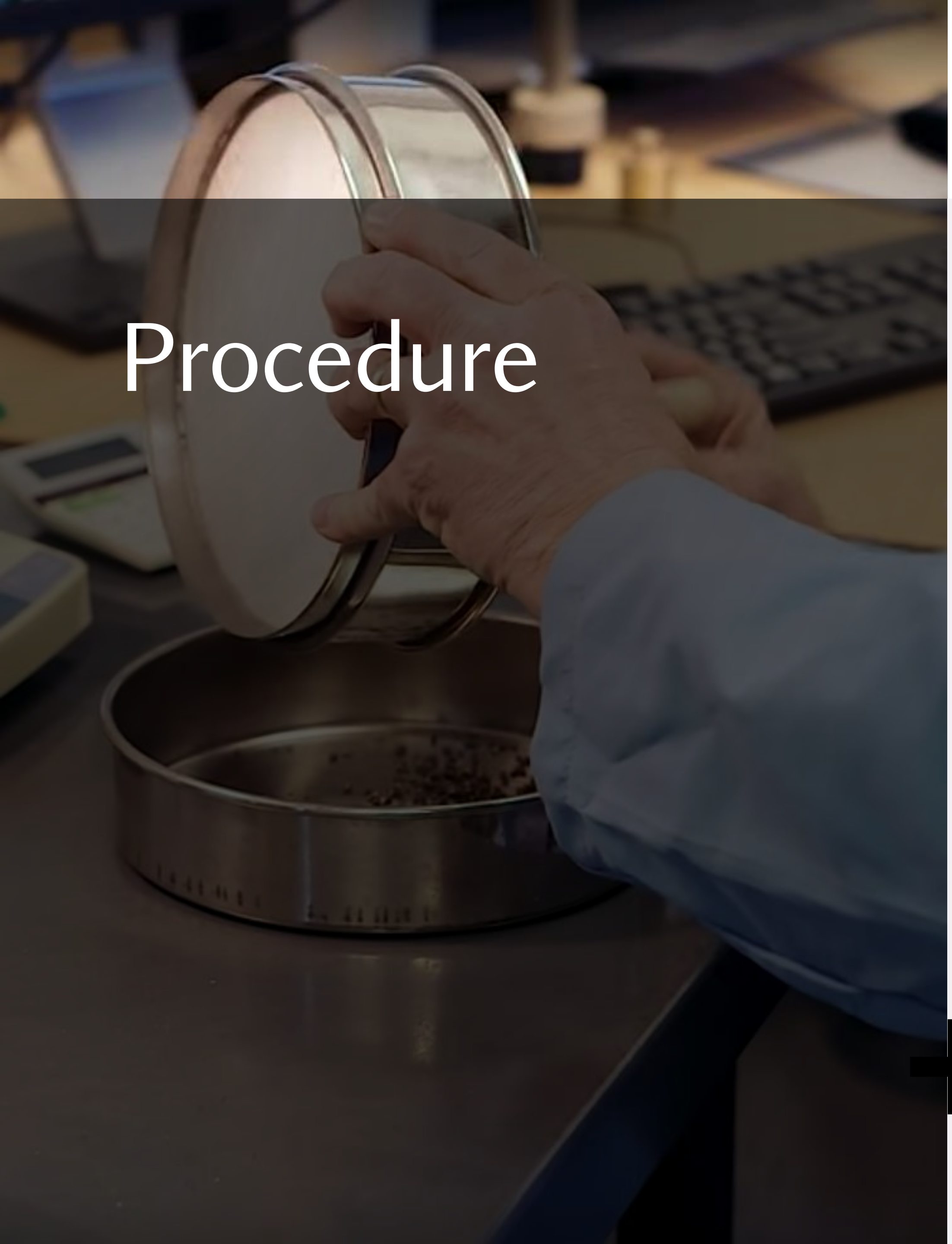
- Over and under sifting can be prevented by sifter efficiency tests (more on this later)
- Ash Curve can show potential issues with over and under sifting
- Purifier tune ups will ensure proper semolina distribution over the grinding passages
- Are the Bran finishers in good condition? (more on this later)



Sifter Efficiency Test

Why test the sifter efficiency?

- Sifter efficiency will change with temperature and humidity
- Most drastic changes are between winter and summer but can often be seen between day and night
- Lower temps and humidity:
  - More efficient sifting
  - Higher ash
  - More bran particles in the flour
- Higher temps and humidity:
  - Less efficient sifting
  - Lower yields
  - Carryover and grinding issues



Procedure

- Take 100g samples of last flour screen overs of each section
- Sift sample for 1 minute over same screen as in sifter or predetermined flour screen size
- Record % or throughs
- Analyze through flour ash
- Set ideal through % range
- Repeat step 1-3 every month and adjust flour screens accordingly

			Target
Date samples are taken on	5/27/22		
Flour moisture	14.3		
Flour Ash	0.52		
Temperature on Sifter floor	87.06		
Humidity on Sifter floor	52%		
Weather	Overcast/Rainy		
Wheat Mix	HRW		
Flowrate on 1BK (lb/hour)	31,000		
Wheat moisture	15.4		
Extraction			
Flour	76.2		
Clear/Farina	0.0		
Feed	21.8		

from	Flour Screens	132 (10XX)	Thru. FL Ash	132 (10XX)
1,2BK A	~~118,~~ 150	39%	**0.493**	
1,2BK C	~~118,~~ 150	25%	**0.494**	
1,2BK D	~~118,~~ 150	43%	**0.475**	
3,4BK C	~~132,~~ 150	20%	**0.667**	
3,4BK D	~~132,~~ 150	24%	**0.665**	
GR1 A	~~112, 118,~~ 132, (150)	4%	**0.478**	**< 10%**
GR2 B	~~132,~~ 150	25%	**0.693**	**abt. 10%**
5,6BK	112, 118	47%	**1.157**	**10-20%**
FD1 B	132, 150	12%	**0.854**	**abt. 10%**
BD2 H	118	13%	**1.349**	**10-20%**
1,2MA E	~~100,~~ 118, 132, (150)	3%	**0.318**	**< 10%**
1,2MA H	~~100,~~ 118, 132, (150)	6%	**0.370**	**< 10%**
1,2MB G	118, 132	14%	**0.406**	**< 10%**
3,4M B	100, 112. 118. (132)	10%	**0.650**	**abt. 10%**
3,4M F	100, 112. 118. (132)	12%	**0.674**	**abt. 10%**
5,6M F	118, 132	5%	**0.850**	**abt. 10%**
7,8M G	112, 118, (132)	18%	**1.201**	**10-20%**
9,10M G	118, 132, (150)	18%	**1.449**	**10-20%**
11,12M H	112, 118	6%	**1.157**	**10-20%**

Milling and weather data to build database and predict screen changes.

Milling Passage and actual screen size

Sieving and ash data.
Target range for sieving data.

Achieving the optimal Break Release

The optimal break Release depends on:

- Type of Wheat: soft, hard, durum
- Design on the break system (short, Long)
- Design of the grinding system
- The finished product specification
- The tempering condition
- Temperature and Humidity


Break stock
>1110 µm
Coarse semolina
1110-660 µm
Medium semolina
660-461 µm
Fine Semolina
461-236 µm
Middlings
236-112 µm
Flour
<112 µm

Optimum break release Test

The grinding pressure on the semolina producing breaks: 1BK –3BK must be properly balanced to achieve the optimum result. The target is to achieve the highest amount of semolina with the lowest possible ash.

Break release	total semo yield	average ash content
25 / 55	73.9%	0.707
25 / 53	72.4%	0.692
30 / 50	71.8%	0.711
30 / 45	71.8%	0.682
20 / 54	72.5%	0.700
20 / 49	73.2%	0.662

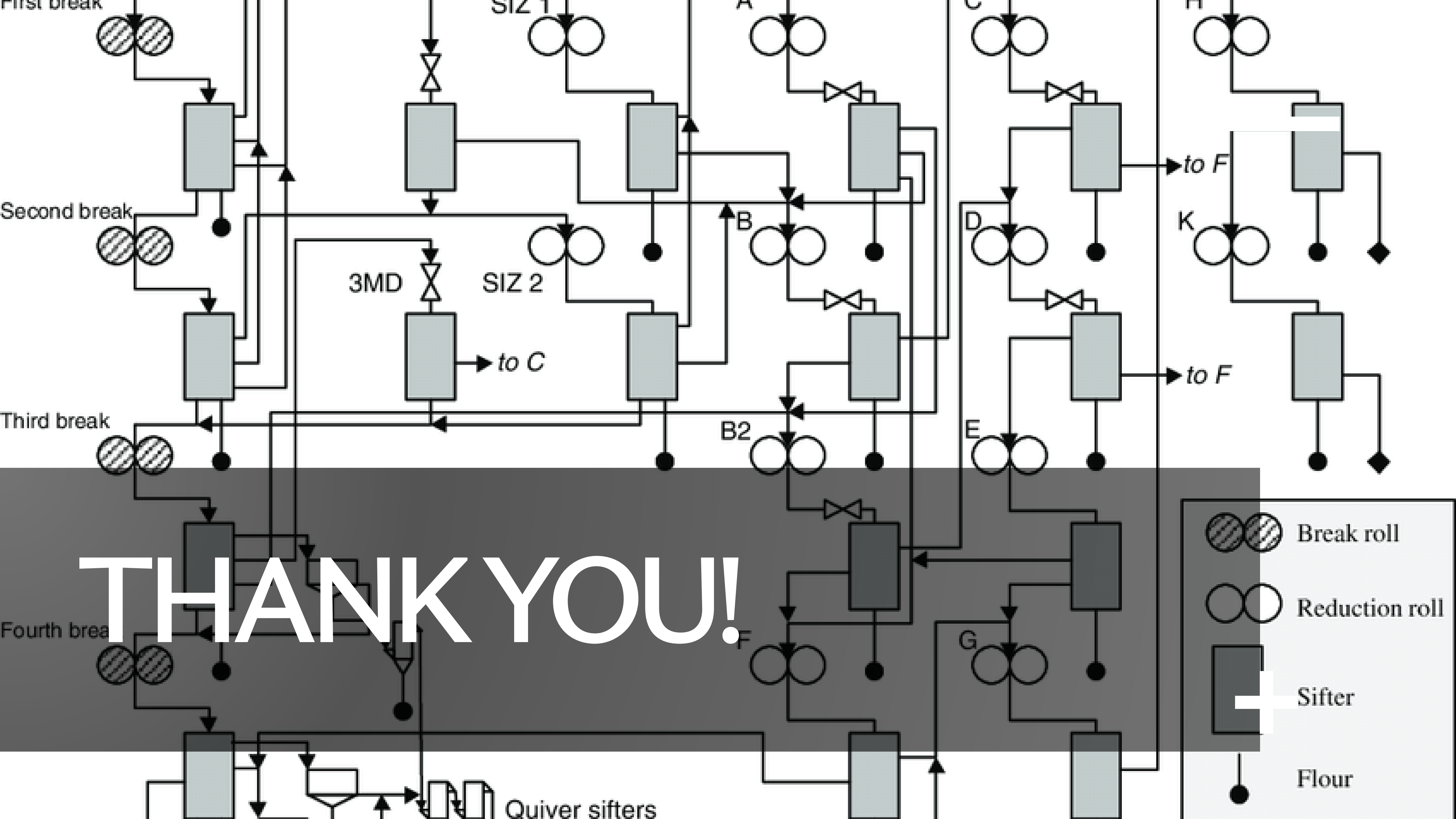
			Break Release 1B/2B				Break Release 1B/2B			
Pass.	from Passag	Granulation	1B: 20% 2B: 54%				1B: 20% 2B: 49%			
			kg/h	%1B	Ash 14%	Ash Av.	kg/h	%1B	Ash 14%	Ash Av.
P1	**B1**	semo coarse	740.0	10.57	0.831	0.831	740.0	10.57	0.831	0.831
P2	**B2**	semo coarse	956.0	13.66	0.896	0.868	1048.0	14.97	0.76	0.789
P3	**B1**	semo medium	580.0	8.29	0.594	0.798	580.0	8.29	0.58	0.738
P4	**B2 / R**	semo medium	1044.0	14.91	0.546	0.719	864.0	12.34	0.538	0.685
P5	**B1 / B2 / R**	semo fine	664.0	9.49	0.468	0.677	584.0	8.34	0.461	0.650
P6	**B1 / B2 / R**	middlings	364.0	5.20	0.436	0.657	312.0	4.46	0.45	0.635
P7	**B3**	semo fine	316.0	4.51	1.264	0.698	464.0	6.63	0.93	0.665
P8	**B3**	middlings	408.0	5.83	0.728	0.700	532.0	7.60	0.634	0.662
			5072.0	72.5			5124.0	73.2		

Bran finisher adjustment and maintanace

Spring and early summer

Check your **Bran finishers** (recover high protein flour):

- What do the overs and throughs look like?
- Are we having flour and endosperm left on the bran after the last bran finisher? (check rest starch in lab)
- Any endosperm in the shorts stream?
- Are beaters in good condition?
- Still sharp or do they need to be turned, replaced?
- Are the gaps of beaters adjusted well?
- Change screens on a regular basis before they get holes.


THANK YOU!
First break
SIZ 1
A
C
H
to F
Second break
B
D
K
3MD
SIZ 2
to C
to F
Third break
B2
E
F
G
Quiver sifters
Break roll
Reduction roll
Sifter
Flour