



AMERICAN
CIDER
ASSOCIATION

Pressing Ahead: Optimizing Your Belt Press for Success

PRESENTED BY:

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AGENDA

- 1** Belt Press Fundamentals
- 2** Optimizing Your Pressing
- 3** Servicing and Care Best Practices
- 4** Q & A



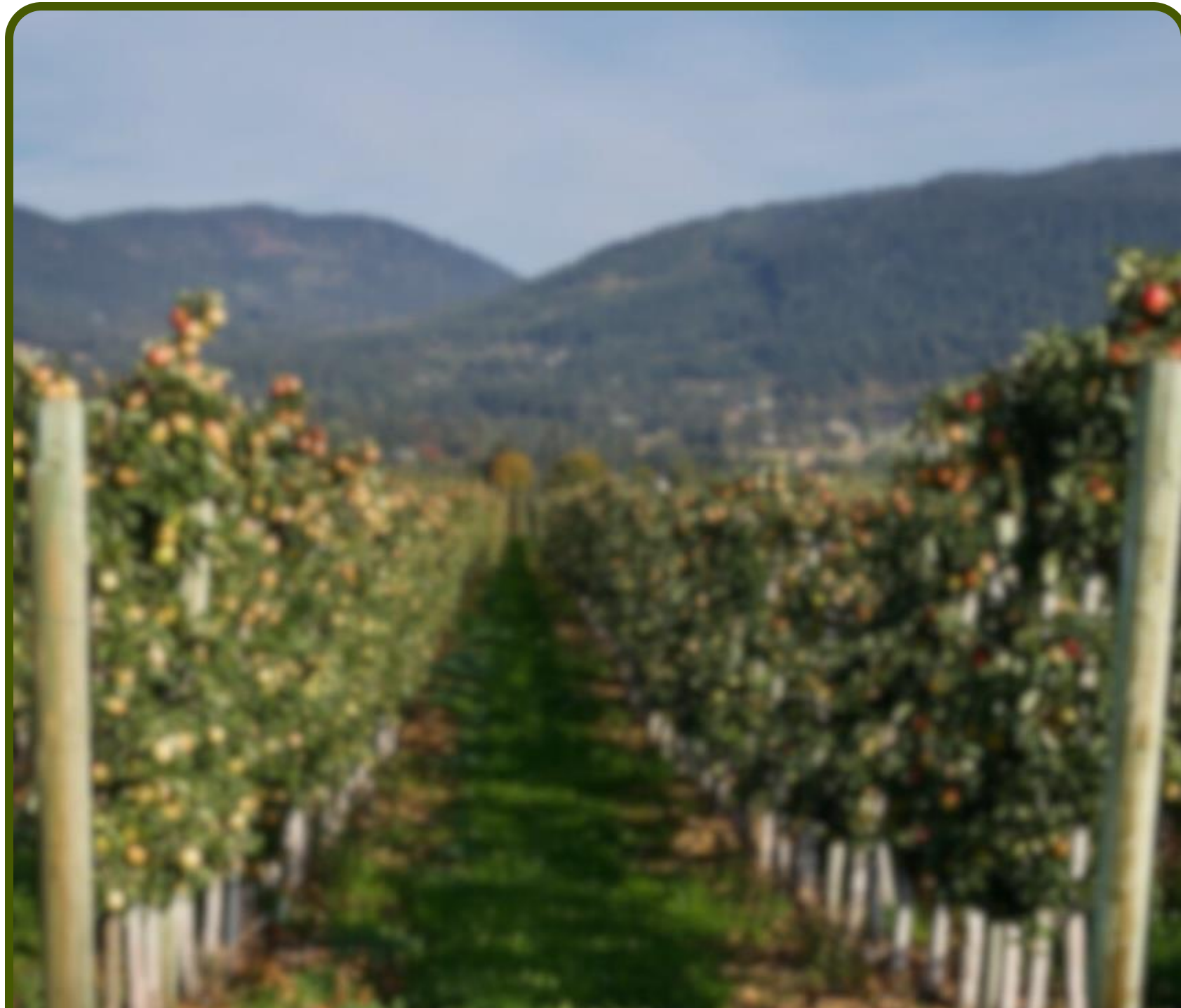


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Are You Getting the Most Out of Your Belt Press?



Even experienced cider makers can face challenges in:

- Maximizing juice yield.
- Maintaining consistent quality.
- Adapting Pressing techniques to the fruit.

Your belt press is a powerful tool, but small adjustments can lead to:

- Higher profitability.
- Reduced waste.
- Improved product consistency.



Belt Press Fundamentals: How it works

Pomace Introduction:

- Milled pomace enters the dosing box via gravity or a variable-speed pump.
- Cake thickness and width (if adjustable) are determined here



Belt Press Fundamentals: How it works

Gravity Dewatering:

- Free-run liquid drains through the belt into the collection pan.
- This happens in the wedge zone on most single belt presses.
- Most double belt presses have a horizontal section where this occurs, before the wedge zone.

Wedge Zone:

- Compression entering initial pressing roller removes up to 70% of juice.
- The press cake is formed here under low pressure.
- Initial adjustments may be needed if cake is too thick or wide for condition of fruit.

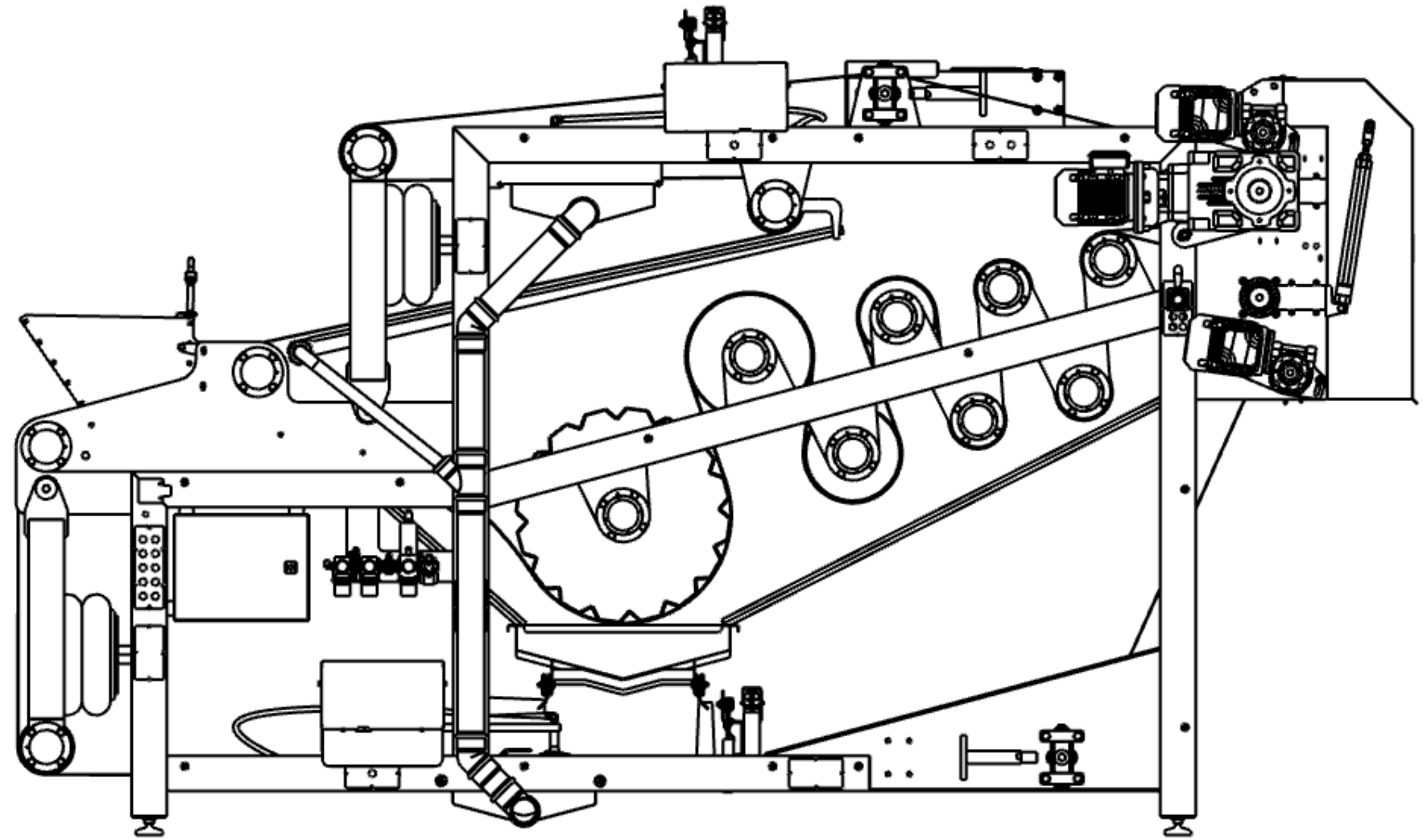
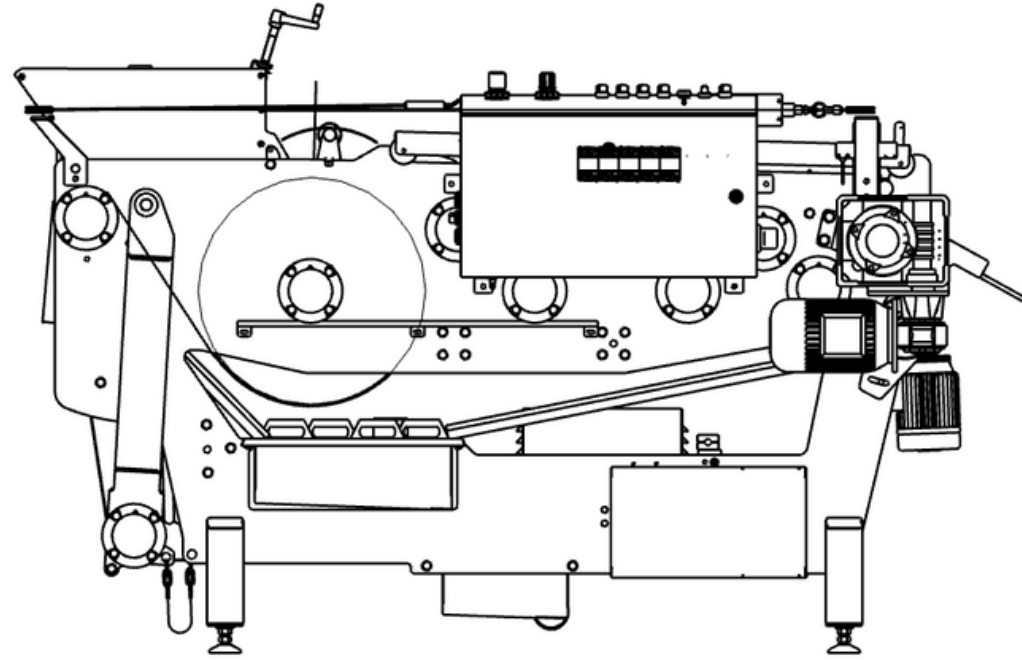
Belt Press Fundamentals: How it works

Pressing Rollers:

- High-pressure rollers apply compressive and shear forces.
- Progressively smaller rollers apply increasing amounts of pressure



Single vs. Double Belt Presses:



Single Belt Press



Gravity Dewatering

Happens in the wedge zone of the press



Scrapers

Are used to move the press cake from one roller to the next



Rollers

Less pressing rollers than a double belt press, typically one to five in total



Gravity Dewatering

Dedicated horizontal dewatering section, to maximize extraction before the rollers.



Belts

The cake is sandwiched between two belts and pressed as it travels under and over each roller



Rollers

More pressing rollers than single belt presses, generally from eight to fifteen. May include press nips for higher yields

Double Belt Presses



Belt Press Fundamentals: How it works

Pomace Removal:

- Scrapers remove the pomace from the belt.
- Optional cleaning brushes can further clean the belt to remove sticky pomace before belt washing.



Belt Washing:

- Further cleans the belt and serves to maintain yield.

Optimizing Your Pressing



Getting the Most Out of Your Belt Press:

Practical tips for optimizing the belt press settings:

- Selecting fruit and timing the pressing
- Troubleshooting poor cake formation
- Adjusting the feed rate
- Manipulating Belt Pressure
- Changing the belt speed
- Cleaning the belt
- Maintenance and care best practices.



Selecting The Fruit And Timing Your Pressing



Selecting Optimal Fruit:

- Look for crisp, fresh, ripe fruit wherever possible.
- Time your pressing for when fruit is at it's best.

When your fruit is not ideal:

- More time spent sorting
- Lower throughput
- Lower yield
- More sediment
- More time spent cleaning.

Optimizing Consistency for Better Yield

What to Adjust:

- The blend of apples you will be pressing.



Why Adjust it:

- Firmer fruit acts as a natural press aid
- Better cake structure allows higher throughput
- Being able to squeeze harder improves yield
- A thicker cake reduces sediment





Optimizing Consistency for Better Yield

When to Adjust it:

- Prior to pressing, if problems with cake consistency or condition of fruit are expected
- If fruit has degraded in storage while waiting to be pressed

How to adjust it:

- Blend bins of fruit.
- Mix degraded fruit with fresher fruit of the same varietal
- Mix softer fruit with firmer, dryer apples where varietal flexibility is an option.

Adjusting Feed Rate



What to Adjust:

- The amount of pomace being supplied to the press

How to Adjust it:

- Variable speed controls on pomace pump or elevator crusher
- Adjusting infeed speed upstream

Adjusting Feed Rate

Why Adjust it:

- Increase throughput
- Compensate for degraded fruit
- To ensure the press is running at capacity

When to Adjust it:

- Increase with good fruit for better throughput
- Decrease to compensate for degraded fruit.
- Adjust to control the cake thickness if your press can not control this at the dosing box.



Troubleshooting Poor Cake Formation

What to Adjust:

- How much pomace is used to make the press cake
- How widely spread the pomace is on the belt

How to adjust it:

- Manipulate settings on the dosing box of the press (if available)
- Make the cake thicker or thinner
- Make the cake wider or narrower





Troubleshooting Poor Cake Formation

Why Adjust it:

- To increase or decrease throughput
- To improve yield
- To manage sediment

When to Adjust it:

- Pomace runs off the belt edges- reduce height, then width
- When there is too much sediment in the juice- add height
- Cake is backing up at the rollers (single belt)- reduce height
- Cake is causing bulge in center of belts (double belt)- increase width then decrease height



Manipulating Belt Pressure



What to Adjust:

- How hard you are squeezing the fruit

How to Adjust it:

- Varies from press to press typically a dial or air pressure control.

Manipulating Belt Pressure



Why Adjust it:

- To keep mash cake on belt.
- To lower sediment levels in the juice.
- To increase yield.

When to Adjust it:

- Lower the pressure when you have reduced feed speed and cake thickness and mash still wants to run off the belt
- If there is too much sediment in the juice and you've increased cake thickness (if possible), reduce the pressure
- If your yield is too low, and the cake is setting up well, increase the belt pressure*

*Always observe maximum rated pressure.

Adjusting Belt Speed for Yield and Throughput



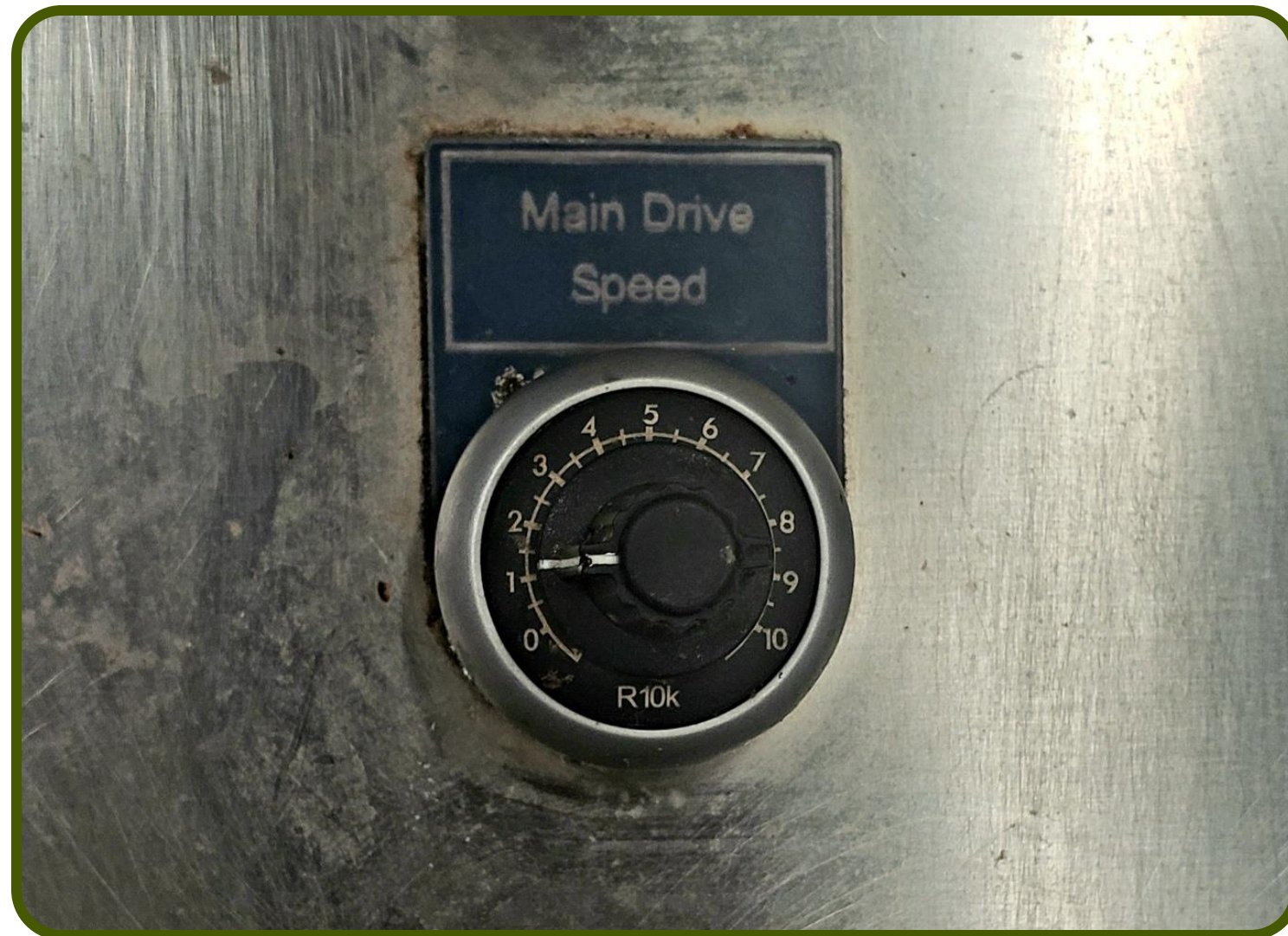
What to Adjust:

- How quickly the press belt travels through the rollers
- How long the cake spends under pressure

How to Adjust it:

- Via a variable speed control on the press drive motor(s)

Adjusting Belt Speed for Yield and Throughput



Why Adjust it:

- Adjusting the feed rate, cake thickness, and belt pressure is not providing desired results

When to Adjust it:

- You want more yield- slow it down
- You want less sediment- speed it up
- You want more throughput- speed it up

The Importance of Effective Belt Cleaning

What to Adjust:

- How frequently the belt is cleaned
- The speed of the belt travelling past the cleaner

How to Adjust it:

- Provided you have a built in belt cleaning system, turn the wash arm and the pressure washer on or off accordingly
- Without a built in belt wash system, pressure wash your belt for a few rotations after mash is scraped off
- Ensure adequate pressure and flow for the system
- Slow the belt speed for more effective cleaning

The Importance of Effective Belt Cleaning

Why Adjust it:

- To keep yields high
- To reduce water usage with high quality fruit

When to Adjust it:

- Run intermittently if the belt is free of debris and sediment after the cake is scraped off
- Run constantly if the belt is not being cleaned effectively, and cake is less dry than at the start of your pressing



A note on Dilution due to Belt Washing

Does washing the belt dilute the juice?

Our findings show that washing the belt can add anywhere from 0.2% to 2% water to the output volume of juice, depending on press settings. This translates to a reduction of less than 1 deg brix.

How to Reduce it:

- Installing an air knife following the belt washer in our trials reduced dilution to around 0.05% of the output volume of juice, a negligible amount.

Why Adjust it:

- When dilution of juice to any degree is unacceptable.

Servicing and Care Best Practices

Daily Maintenance Recommendations to Keep your Press running smoothly



Inspect your scraper edge(s)



Check the integrity of the belt seam



Check your press roller bearings



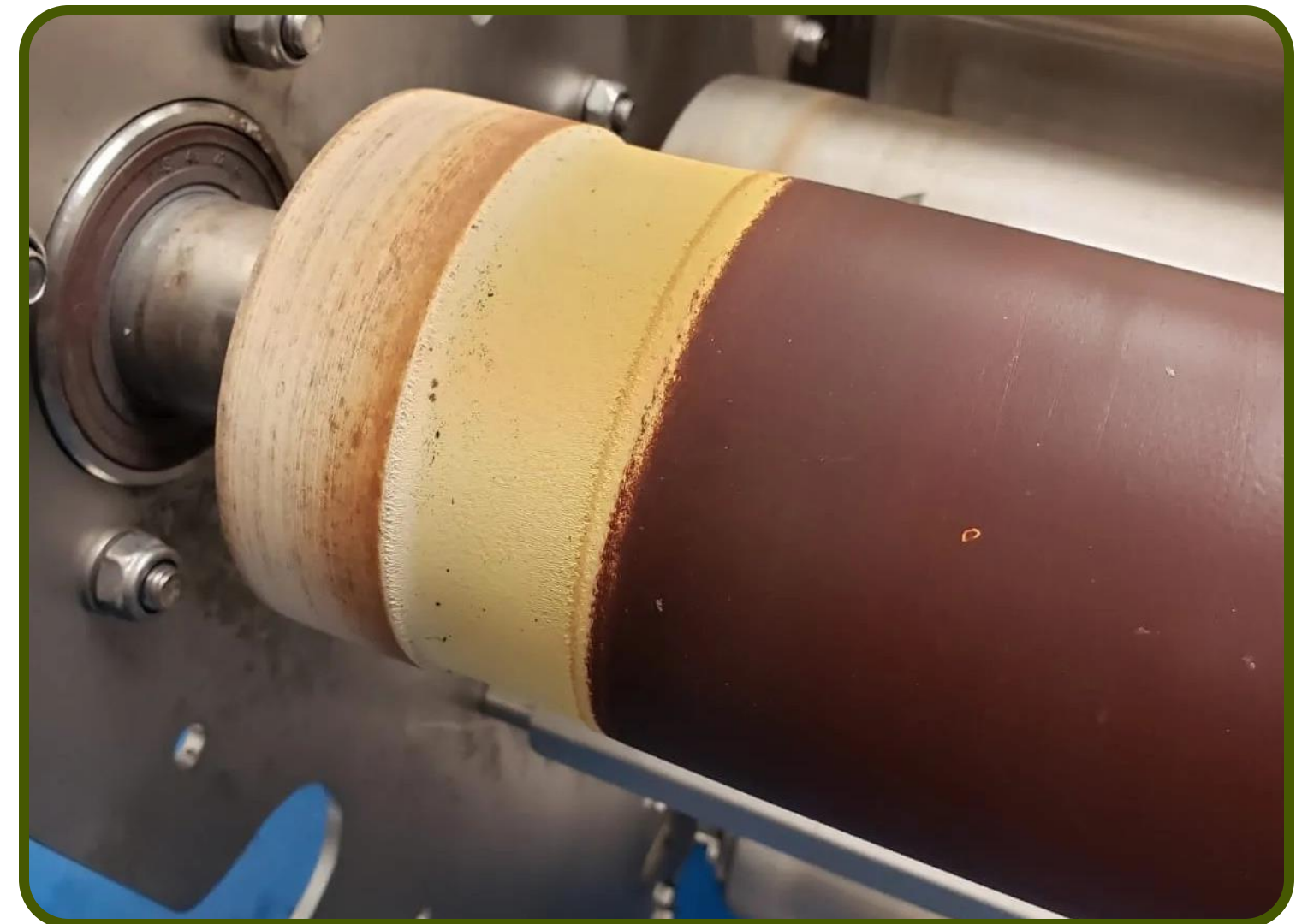
Test the function of your belt centering devices

Servicing and Care Best Practices

Maintenance and Care Best Practices, cont.

When deep cleaning the machine:

- Clean the machine with caustic
- Ensure adequate stock of critical spares
- Inspect all wear parts
 - Belts
 - Wash arms
 - Shaft seals and bearings



Key Takeaways: Optimizing Throughput



What to Adjust:

- Select fruit with optimal structure for pressing - Crisp and Fresh
- Run the thickest and widest cake possible
- Increase the pressure until yield is at its highest point
- Increase the belt speed

Key Takeaways: Maximizing Yield



What to Adjust:

- Select optimal fruit for pressing- Crisp and Fresh
- Run a medium to thin press cake
- Run the highest possible belt pressure
- Decrease belt speed, so cake spends more time under pressure
- Ensure belt is well cleaned

Key Takeaways: Minimizing Sediment

What to Adjust:

- Select optimal fruit for pressing- Crisp and Fresh
- Run a thick press cake to take advantage of it acting as a filter
- Reduce belt pressure, Especially with softer pomace
- Increase belt speed, so cake spends less time under pressure





Thank You!

Questions?

- The rest of our time will be dedicated to answering any questions you might have.

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