**Forecast concept:** To visualize the net amount of mushroom can be harvested from a particular tunnel so that farm stays confident to hit the set target for the day and get ready for a day with low yield.

**Why** do you make forecast (goal) and why team leaders are forecasters? **How** forecast output is used, relevant to harvest and sell?

Teams leaders do forecast as they have prior understanding of hands-on picking. They gathered knowledge during boxing and pelleting mushrooms. They have an idea of the weight of pallets and boxes. This is similar to size and weight correlation. Forecasters enter a tunnel and go to the top shelf so they can see almost every shelf. It helps them have an overall idea of growth in that tunnel. Next, they walk through stacks (stack is a vertical placement of 4 shelves together) and have closer view of the clusters per square meter, coloration, roundness/form of caps and number of mushrooms per clusters. Compost weight and quality on that day contributes to harvestable amount. Growers manage this information. If growers say the compost is perfect that means forecasters will forecast considering good amount to be harvested from that tunnel otherwise, they know that the tunnel will not perform as expected and adjust their forecast accordingly putting estimation a little down. Therefore, compost quality is also a key factor behind forecasting.

Without forecasting, how can a team leader decide **how many kilos** can be expected form a particular tunnel. Based on that they put **pickers** to pick the mushrooms. The higher the number of kilos is, the more pickers are placed having more experience. Forecast gives an idea of the **class** of mushrooms that is going to come out of a tunnel either. Class 1 or class A is considered to be best in quality whereas class 2 or B is considered being low quality having discoloration, opened and deformation cap, longer stalk with low price

For example:

Tunnel 1 is expected 12 ton at the end of harvest, on day 1, 200kgs are expected dividing it 20-25 mm being 65%; 25-30 being 20% and >30mm the rest including 10% flat, given, 6-7% goes under Class B and the rest Class A. based on 12 ton every day picker numbers are adjusted but this information is not relevant to the harvester as a single harvester will harvest a full shelf.

One thing to note is that brown mushrooms are lighter than white mushrooms. So brown mushrooms are low in price. The farm considers-

20- 30 mm : baby button mushrooms

35- 65 mm : Close cup mushrooms

70- 130 mm: - Flat mushrooms

Given, most of the mushroom farms consider 35-65mm as a standard size of mushroom unless it is flat. Flat mushroom can grow upto 120 mm

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**What** is the input and output of your forecasting system. What is the role of forecasters in that system?

The forecast is mainly human based, they use excell sheel to record human estimated forecast and actual harvest data. They also store 3 months of data though.

The output can be simplified being no of kgs in terms of class. Forecasters make a weeklong forecast at the beginning of the flush and adjust every single day as harvesting goes. Summing daily forecast up will give rise to net production of a single flush of a single tunnel. Obviously, net production goes lower as flush approaches to the final flush (mostly flush 3)

The automated forecasting system should give number of kgs on a daily basis for a week alongside the number of mushrooms and weight corresponding to Class A and B.

----------------------------------------------------Clarify-----------------------------------------------------

* The forecast is prepared every morning, for each tunnel divided into divisions (by size and class of mushrooms): why do you need to make divisions and how it helps in forecasting?

To identify high and low producing tunnels

* Do you grow more than one variety of mushrooms in single tunnel?

In terms of color no. If white it is full white, same for brown. The farm grows Bisporus family mushrooms only. In terms of scientific variety, no. In terms of size, it depends on the customer. For example, if there is a huge demand for flat (Potrabell)then some of the tunnels will be selected for flat and separation will be done to achieve that.

* Best yield (best ripeness with 65mm)35-65 mm for close cups or 80-110 mm for flat mushrooms why not 80-110 for close cups or beyond?

Baby buttons can reach more than 65/80 only flat mushrooms can reach up to 120 mm

* How our forecast system may work (not finalised though)

A full scan of the bed -> List of size range with counts

|  |  |
| --- | --- |
| SIZE | COUNT |
| 25-30 | 2300 |
| 35-40 | 1290 |
| 45-55 | 998 |
| ... | ... |

->Human intervention-> human est vs machine est (kg) + ...(?) class a class b

**#** 1mm/hour- mushroom growth // 12/18 hours half in *size and weight-It is an approximation*

---------------------------------------------Side Questions----------- --------------------------------------

**F**orecaster knows what size to be picked, with gained experience they know how much (kgs) can be expected.

No of clusters/ size of clusters, number of mushrooms in a single cluster, likelihood of discoloration, compost status (compost quality, depth of compost, growers comment on it, compost reactivity and so on)

**W**ith **25-30** mm size on 1st day >>> **N** no of mushrooms/sqm in **X**sqm ; given 30g weighs 1 mushroom >>> **.003 n X** kg in that tunnel on that day

This maths is right but considering only one size e.g. 25-30mm makes it wrong. In a cluster there might be 5 different sizes of mushroom. This calculation needs to be done for each of those sizes and added up. Then only it may seem close to the algorithm the human forecaster does forecasting on.

**W**hat specification do you get for Tesco baby button (200g- Size etc.)

Size banding, stalk length, white/brown

**------------------------------------------------------------------------------------------------------------**

**#** Next in-person meeting in the farm

20th and 21st Feb

Rough notes-------------------------------------------------------------------------------------------

With 1st flush, in 5 days,12 ton may be harvested from a good tunnel.

Signs to consider for a full tunnel inspection

Quality of staggers, staggers size, **pin set**, compost state and weight (depth, growers check temp, humidity, water supply, co2, fanning, issue/reactivity), health of pickers, mechanical breakdown of environment, day of pick, cluster status

5-7 mushrooms in a cluster> 1 or 2(for 7) can be removed

12 ton 1 budget : 30.5 / 17 (less ) organic 23kg/ 3flush

#-- staggers,, 5 different sizes, small and big stay, stalk size(if it is big, class B, cap will not grow) what do you do whence big stalk mushroom is found- pick then and there or leave or else

With the harvester with good forecast >>> Avoid 2nd class >>> Increase in farm profit