



MGA Technical note September 2012

By Simon Draper, MGA Agronomist

Harvesting Forage Maize in a difficult season

Maize in the drier and warmer eastern half of the country is generally average /good and harvest is now underway. In the west a different story has developed, with many crops having struggled for a multitude of reasons from drilling.

With such a contrast in conditions and crop growth stage, working out the right date for harvest will be very difficult. This task will be particularly difficult for growers with stunted crops, which may or may not have a viable cob.

The good news is that the warmer weather of September has advanced crop maturity in all areas and even many of those with stunted crops now have cobs, which given time will lay down starch. Ironically if the starch is laid down in these stunted crops, then overall maize quality could be good. Yields will of course be down considerably.

The advice here is to 'wait as long as you dare' to ensure that the cobs have as much starch in as possible. That said, it cannot be forgotten that delaying harvest is not generally a good idea, as poor harvest conditions and frost can cause as much of a yield loss as is trying to be gained by delaying the harvest for maximum starch yield.

So what's best?

For all crops, accurate testing of the dry matter is a must this year - We should be aiming for an ideal total crop DM of 30-32%. Total crop Dry Matter should be within the range of 28- 35% DM. As the season progresses, the crop dry down rate increases. As a general rule, the crop should dry at 2% per week and therefore once the dry matter has been established, it should be possible to decide on the correct harvest date for the crop. It should be noted that this 2% dry down only starts when the crop has reached 20% Dry mater and so your first step is to work out if your crops have reached this point.

- if the grains are generally pale yellow and they have no taste apart from water then they have not started laying down sugar and any further tests need to be delayed for another week.
- if the grains have a yellow colour to them and taste of sugar, then they are normally at least 20% and testing should be commenced to determine their dry matter.
- if the grains are yellow- orange and have lost their sweet taste and now are floury and taste of starch (a sort of chestnut taste), but still have some juice water in them, it is likely that they will be around 28%.
- if the grains are floury to taste and have no water in them when bitten, then they are likely to be 32% and ready to harvest.

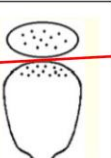
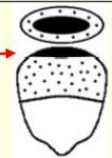
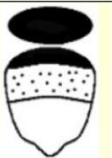


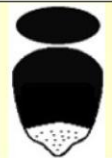
To be sure of the current DM, the crop should be sampled and tested properly - to do this you should select representative plants from at least 5 points in the field. A representative plant is chosen by stripping back the cobs on 10 adjacent plants and then choosing the average plant from the group.

Testing then can be carried out by placing the chopped up plant into the cold oven of the AGA overnight. The crop DM is determined by using the following formula.

$$\frac{\text{Final Weight (g)}}{\text{Initial Weight (g)}} \times 100 = \text{DM\% of sample}$$

Overnight drying is slow and a faster method is either to use the milk line test, or a microwave oven, both which will allow you to make a good estimate of the whole crop dry matter.

Milk Line Dry Matter Assessment Guide

Grain Stage	Milky	Milky doughy	Doughy milky	Doughy	Hard dough	Hard and glassy
Grain Aspect (from central crown)	All milk - no milk line	Milk line begins to show from the top	Milk line 1/4	Milk line 1/3	Milk line 1/2 and top becomes glassy and hard	Top half of grain glassy and hard, no milk stage
Husk	Green	Green	Green	Yellowing	Yellowing	Desiccated
Grain DM %	Less than 52%	Less than 52%	52	55	58	More than 58
Kernel Milk Line						
Whole Plant DM%	Less than 25%	25-28	28-30	30-32	32-35	More than 35

The Microwave Test:

- Cut one whole representative plant 6-8 inches from the ground.
- Chop plant into inch long sections.
- Cut the cob down its length, before cutting into inch sections.
- Mix maize thoroughly in a bucket.
- Tip the contents of the bucket into a microwave safe bowl, weigh and record this pre drying weight.
- Put the bowl of maize in the microwave. Place a glass of water alongside the maize (to minimize the risk of burning the maize).
- Heat the maize for 10 minutes. Stir and then repeat. Stir again and then heat for a further 10 minutes. At this point, weigh the sample. Heat the sample for a further 2 minutes and weigh again. Keep going with this 2-minute heat/weigh cycle until the sample stops losing weight. Keep a close eye on the maize as if it dries too much it will start to smolder/burn.
- Remember that the more mature a crop is, the less time it will need to be heated.
- The dry matter of the sample is the final weight of the sample expressed as a percentage of the original sample fresh weight, using the calculation shown above.

Frost Damage

With many crops being left as long as possible, it is again vital not to leave it too long - when the crop loses its green leaf through disease/frost etc, the dry matter of the crop increases rapidly and once over 35% it loses feed value and becomes difficult to ensile properly. Therefore, if frost occurs, please ensure harvest commences before at least the 3rd frost, as normally the maize plant will cope with one or two frosts before it becomes severely damaged.

Chop length

On average, chop length should be at 12 mm, but there is a range - from 5 mm to 35 mm, (0.25" to almost 1.5") - both are extreme. The shorter the chop length, the denser the clamp, the more stable the maize. This may remain an overriding consideration if the dry matter is 35% or above. Longer chop length might be required where maize makes up more than 50% of the forage in a dairy diet and the diet is high in starch/sugar (25%+). Increasing the maize chop length (18 – 22 mm) can reduce/remove the need for additional straw or hay in the diet.

However, above 25 mm clamp consolidation and forage intakes may suffer.

Stubble height

Most maize is harvested at 10cm above ground, as the bottom part of the plant is relatively low in energy and also relatively wet. However following MGA trials last year, newer varieties have more feed value in the bottom of the plant and therefore in a year where you are likely to be tight for forage, harvesting as low to the ground as possible would be a sensible option.

Silage additives

- Maize ferments well and does not typically require additive to establish a stable fermentation.
- Additives are no substitute for good management in ensiling maize – indeed money will be wasted if there is not attention to detail in ensiling (and feedout).
- Main reasons for using additive are :-
 - to give better stability and keeping quality of the silage.
 - to improve digestibility, intake and feeding value.
- Many additives claim to improve aerobic stability – active ingredients include Lactobacillus buchneri, Lactobacillus brevis, Sorbic acid, Alliin, certain sterilants.
- Lactobacillus plantarum (and other lactic acid bacteria) may be used to encourage a more efficient lactic fermentation, but the lactic acid can itself be a substrate for yeast and moulds. Therefore, lactic acid bacteria can be of benefit when combined with L.buchneri / brevis or with a chemical preservative.
- Some additives claim to enhance the digestibility and intake by reducing the bonding of lignin and increasing carbohydrate availability.
- If additive use results in a cooler and fresher maize silage, then overall energy intake is likely to be enhanced.
- If you have had aerobic spoilage problems in the past or anticipate such problems due to clamp design, additives alongside good clamp management will work.

Filling the Silage Pit

Maize needs to be made quickly, well consolidated and completely sealed to allow anaerobic (without oxygen) fermentation to occur. Ideally one tractor should be rolling the pit continuously, whilst another is spreading new maize in thin layers on top.

Fill the clamp in thin layers, using a shallow rather than steep wedge. To ensure that the whole clamp, including the shoulders are well compacted, consolidate thoroughly from the bottom and fill and roll the pit in a saucer shape.

Sheeting down the pit

Good sealing of the clamp is vital. Side sheets, as well as double top sheets should be used and weighted down and if vermin are a concern, net the clamp over the top of the tyres / weights.

Ensure you use the thin clear plastic sheets ('cling film') - Place over the maize IMMEDIATELY the clamp filling is complete. This layer is thin enough to be sucked onto the maize surface, but tough enough to remain intact when laid out.

www.maizegrowersassociation.co.uk

info@maizegrowersassociation.co.uk