



The Use of Inoculants



Inoculants for Whole Crop Silage

Whole-crop silage harvested at the right time and made well will invariably make good quality silage. The use of inoculants provides additional protection in situations where the quality of the resulting silage is compromised. Inoculants will not improve a poor quality crop but will reduce the losses from silage made in sub-optimal conditions. Therefore, inoculants are recommended in all situations as an insurance against factors that can cause losses.

Principles of silage making:

1. Cut at the time of best herbage quality and dry matter content, but preference should be given to ensiling at the best dry matter content to achieve good ensiling.
2. Dry matter content for best preservation is achieved at 34-40% (60-66% moisture).
3. Chop finely (25-50 mm).
4. Compact thoroughly to squeeze the air out and keep it out.
5. Use a high quality bacterial inoculant. Some inoculants provide additional benefits of improved aerobic stability on opening.
6. The benefits of inoculant use outweigh the costs several times over.

The benefits of inoculant use in cereal silage harvested close to the target dry matter (DM) content was shown in a trial conducted by Crop & Food Research. Wheat silage was made in mini silos from material harvested at DM contents ranging from 31-58%.

The experiment comprised factorial combinations of inoculant (plus and minus treatment) and variable harvest dates for crops of Sapphire wheat grown at two sites in Lincoln. The inoculant used was Sil-All[®] from Alltech. The silos were opened after storage for three months and samples analysed for DM content and fermentation characteristics.

- Inoculant treated silage consistently increased the acidity of the silage by approximately 0.2 pH units over the range of DM contents tested. The average pH for all the treated silages was 4.5 compared to 4.8 in the control untreated silages. In the second trial, the pH average was 4.2 and 4.5 in the control silages.
- Treated silages had reduced lipid too. This result was consistent over the range of percentage of DM tested. In one trial, treated silage had an average lipid level of 3.6% compared to 3.0% for control silages, and in another trial, the lipid level was 4.1% and 3.5% respectively for inoculant treated and control silages.
- Dry matter losses during ensiling were considerably lower under the controlled conditions of mini-silos when compared to bales and stacks of silage made on-farm. Even with these low initial losses, there was a 40% reduction in dry matter loss with treated compared to control silages.
- Inoculant use improved lactic acid production and increased the acidity of the silage by approximately 0.2 pH units over the range of DM contents tested. The lower pH with inoculated silage conferred an improved stability in the stack.
- This study, using Sil-All[®] inoculant, showed the potential for animal performance and economic benefits of inoculant treatment even when DM of fresh cereal was well outside the optimum of 35-40%.

These results showed that silage inoculants can be effective fermentation enhancers for whole-crop wheat silages over a wide range of dry matter contents.

Use of silage additives is recommended over the range of dry matters tested because significant gains in quality result from improved fermentation.

When deciding which additive to use, inoculant suppliers should be asked to provide evidence of efficacy on whole-crop silage because inoculants vary in bacteria types and numbers and presence or absence of enzymes.