

CARROT FIELD STORAGE: REDUCED STRAW AND STRAW ALTERNATIVES

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Background

- Most carrots are stored over winter *in situ* in the field covered with a layer of straw as insulation.
- Straw supply can be volatile and is getting expensive.
- Large amounts of straw can cause nitrogen lock-up for the following crop.
- There are also concerns about introduction of blackgrass with straw.
- Two years of field trials at three sites (Aberdeenshire, Norfolk, Yorkshire) have investigated reduced straw and straw alternatives.

Treatments 2017



Uncovered control.



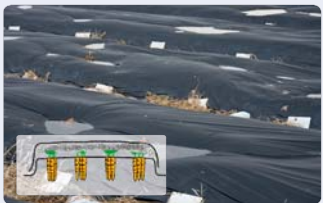
Field standard. Straw or straw over poly.



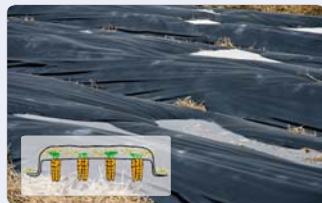
Closed cell PE foam. Used for camping mats, insulation value unaffected by moisture.



Cellulose fibre. Used for insulation, value unaffected by moisture. Absorbs a lot of water.



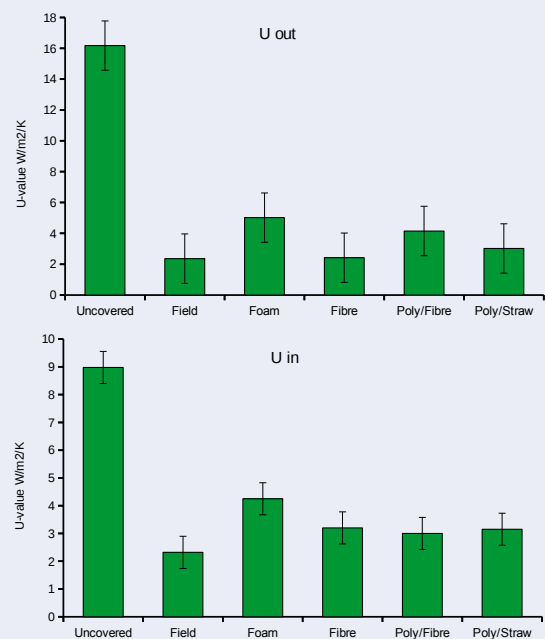
Poly over cellulose fibre. Aiming to keep drier and maximise insulation.



Poly over reduced straw. Straw at 1/3rd rate with poly cover to keep drier, trap air.

Results

- All of the alternatives gave adequate frost protection.



Measurement of soil temperature and moisture to a depth of 50 cm enabled calculation of hourly soil heat loss or gain and U-values (a standard measure of insulation, low = better). U out is for heat loss, U in is for heat gain.

Conclusions

- Conventional straw treatment is inefficient as an insulator.
- Straw usage can be reduced by about 2/3rds by putting polythene over the top instead of underneath.
- Much of the frost protection in conventional straw likely results from the significant thermal mass of water in the bottom layer of straw.
- Polythene below straw means the straw stays wetter, providing a bigger dampening effect and more potential for evaporative cooling.
- Cellulose fibre and similar products could be viable non-straw alternatives, with less potential for nitrogen lock-up and giving a very clean crown.



Sample from under fibre in Yorkshire, April 2017.

PLANT HEALTH SOLUTIONS



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