

# RETURN OF INVESTMENT

## - DSE4200



### Calculation of ROI period for DSE4200 microwave based moisture meter

During baling, the operator usually needs to stop the tractor and jump out of the cabin to make manual moisture measurements with a spear. Depending on the weather and the characteristics of straw, the number of such stops per day will increase during unstable weather conditions, compared to dry periods.

In order to calculate an average ROI period, following example is used:

- No. of stops / day: 6 stops
- Duration of each stop: 3 minutes
- No. of baling days / season: 20 days
- Working hours / day: 10 hours
- Cost per work hour: 144,50 EUR/hour  
(incl. expenses for tractor, baler and operator /excl. diesel)



**Cost of manual measurements / season:**  $((6 \times 3 \times 20) / 60) \times 144,50 \text{ EUR} = \underline{\underline{867,- \text{ EUR}}}$

Users of DSE4200 acknowledge that the manual measurements during baling becomes needless, as they receive reliable measurements directly on the display in the tractor cabin. A study shows that users of DSE4200 in average extend the workday by 30 min to 1 hour, by continuing the baling ever after the dewfall. \*(read back page)

Based on the efficiency improvements of 1/2 extra hour baling / day and costs reduction of manual measurements, the ROI can be calculated:

$$\text{ROI for DSE4200} = \frac{3200 \text{ EUR}}{((10 \times 144,50 \text{ EUR}) + 867 \text{ EUR})} = \underline{\underline{1,4 \text{ years}}}$$

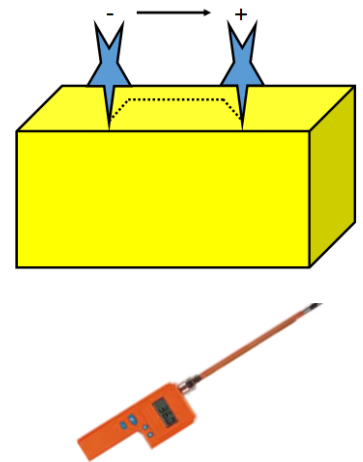
*During the season it happens that to moist material is baled e.g. the winter barley straw containing inbound stem moisture. This losses can be eliminated, reducing the ROI time further.*

## \* MOISTURE MEASUREMENT IN BIOMASS

### Contact based method

The conventional contact based moisture meters measure the conductivity of a material by sending electric current between 2 poles. By its nature, current will seek the easiest way through the material, e.g. through water, which is an excellent conductor of electricity.

When dew or rain drops lay on the surface of the straw, they create a conductive channel that the current will run through, when making moisture measurement in the compressed material. This means that the current only measures the moist areas resulting in to high and misleading moisture values, in respect to the real moisture values in the material. Misleading measurements can make the operator stop the baling to early or use time on manual probes that are based on same contact technology.



### Microwave based method - DSE4200

The microwave method measures the average moisture in bales, based on large measuring area. The microwave signal travels across the entire bale, measuring up to 13.000 cm<sup>3</sup> material (depending on the bale's width). The microwaves capture both the surface moisture and inbound stem moisture, which assures exact, representative measurements of the average moisture.

When the dew falls, the water drops settle on the surface of the windrow, meanwhile the material in the middle and the bottom remains dry for a period of time, which can be used for baling. As the dew content increases, the measurement values will increase equally. The operator can continue the baling till the average moisture in straw reaches the pre-set limit. The microwave method assures accurate and representative measurements that allow to extend the baling by 1/2 to 1 hour per day.

