



Drying and storing rapeseed successfully

Current storage practice

Recent HGCA-funded research compared common practice in rapeseed storage with best practice to identify problems and quantify improvements. This coincided with a survey of 100 growers to identify current problems being experienced when storing rapeseed.

Harvest moisture content

Most growers began harvesting when seed moisture content (mc) was 12%. Fungal spoilage can occur at this moisture content. Accurate mc measurement and rapid drying of grain that is at or above 12% mc is therefore crucial. Harvesting should ideally not begin until mc is below 12%.

Growers typically used moisture meters to set drying times, but also for segregating or blending and determining storage height. Less than half of growers returned meters to the manufacturer for calibration. Accuracy depends on calibration across the mc scale.

Drying

Two-thirds of growers used *hot-air drying* but there was no consensus about safe drying temperatures.

End-users were concerned about rancidity caused by high temperatures.

Research in Canada suggests safe drying temperatures to avoid

rancidity are 70-80°C up to 12.5% mc, and 60-70°C above 12.5% mc.

Over half of growers used *ambient-air drying*, and correctly reduced seed bed depth by half compared with cereals. This compensates for the greater airflow resistance of rapeseed and ensures drying is completed within 14 days. If drying takes longer than this, fungal spoilage, mite infestation and rancidity become real risks. Unless bed depth is adjusted, drying will take at least a month.

Cooling

Cooling is vital to prevent rancidity. Only 28% of farmers compensated for rapeseed resistance by decreasing bed depth but nearly half used ambient air dryers to cool. The increased airflow more than overcomes the extra airflow resistance. Drying fans need only run for about 40 hours to cool rapeseed to the same extent as achieved with cooling fans running for 800 hours.

In cereals, cooling must be fast enough to stop insects completing their life-cycles. As insects only develop in rapeseed with limited success, cooling speed is not as important. Serious saw-toothed grain beetle and rust red grain beetle infestations are very occasionally recorded in

Action:

- Ensure your moisture meter is accurately calibrated each year (ideally by the manufacturer) across the mc range.
- Dry rapeseed to 7.5% mc before storage to ensure freedom from fungi and mites.
- Store rapeseed at half the depth used for cereals to achieve similar cooling and drying rates.
- Cool to below 10°C after drying and record fan hours run.
- Check stored rapeseed periodically for mites beneath the surface to determine the need for treatment (mites can always be found at the surface).
- Consider treatment with DE where surface infestations need to be controlled.

If you are unsure about any of the suggested actions, or want them interpreted for your local conditions, consult a professional agronomist.

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rapeseed, possibly associated with broken or mouldy seed.

Mites

Storing seed at the market mc of 9% will result in several thousand mites/kg throughout the bulk, but at 7% mc infestations usually remain below 100/kg (Figure 1).

At the surface of a bulk, the mc of seed stored at 9% may rise to above 13%, with over 10,000 mites/kg, and rancidity above acceptable market levels. Such infestations **cannot** be controlled using diatomaceous earth (DE), the only top-dressing treatment option.

The moisture content of seed stored at around 7% may increase to about 11% at the surface. Infestations up to 10,000 mites/kg are still possible but these can be controlled by DE top-dressing.

Problems and rejections

About a quarter of growers experienced problems with seed heating or mites. Nearly all rejections by crushers were for admixture, which is best controlled by cleaning or weed control before harvest.

Most growers attributed heating in store to fungi in damp grain, or weevils in dry grain (although weevils do not occur in rapeseed). In experiments, heating was noted at 9%, indicating that hydrolysis or oxidation of oils – especially in broken seed – may be responsible, rather than fungi.

Where heating occurs, increased ventilation volume, ie bigger fans, may be required.

Research in Sweden has shown that both rancidity and insect infestation increase rapidly in seed lots containing high proportions of broken seeds.

Summary

Ideally, rapeseed should be stored at 7.5% mc. Rapeseed becomes brittle and breaks during handling at less than 6% mc, the critical limit for acceptance by crushers. Rancidity occurs mainly in broken seed and may lead to rejection. Spoilage by fungi and mites is likely at over 12% mc. Accurate moisture meter calibration every year is essential.

Rapeseed offers greater resistance to airflow than cereals. Where drying and cooling systems designed for cereal storage are used, bed depth should be reduced by 50% to 70%, depending on fan output. Mites can usually be controlled using DE top-dressing, as long as moisture content in the bulk is low enough.

Further information:

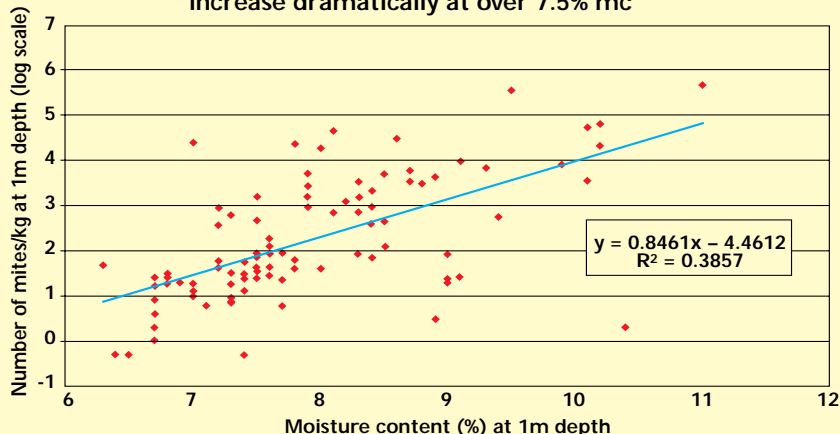
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The grain storage guide, HGCA (revised 2003)

Oilseed rape - a grower's guide, HGCA (2005)

Project Reports 371, 376

Figure 1. Survey results show that mite numbers increase dramatically at over 7.5% mc



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