Wheat and Wheat Flour : Shelf Life

SternIngredients India

Infestation in wheat & flour is a common dilemma faced by all the wheat traders & flour millers. It becomes a challenging task to maintain the quality of wheat & wheat flour.

With proper care & controlled conditioned environment, flour can be stored up to 6 months without any signs of damage. However, in India, it is difficult to achieve this feat. It gets infested within 2 months affecting the shelf life of wheat & flour. Infestation in wheat and flour is imparted due to several reasons, viz.

- Rodent infestation in wheat at the farms
- Moisture content of the wheat/flour
- Storage Conditions
- Storage –Temperature & Humidity
- Cross Contamination
- Unhygienic Conditions
- Cracks on the floors & walls
- Standing water near the stores
- Spillage & bird faeces in the stores/stairs & floors
- Presence of wheat germs in the flour, especially Whole wheat flour.
- Type of packaging materials used
- Birds' nest landing sites & droppings at the stores/mills
- And more

Moisture content in the wheat flour is a crucial parameter that affects the shelf life of the wheat/flour. If the wheat received from the farm is having higher moisture content & it is not cleaned properly it will be infested faster. Wheat should be stored in a clean, hygienic, well-ventilated & isolated store. Stored wheat should be inspected regularly for any infestation. When the wheat is brought to the mill store area, miller should check it for infestation & other quality parameters. After receiving the wheat, it should be fumigated by fumigant namely aluminium phosphide tablets and needs to keep under fumigation for a long time i.e. more than 72 hours.

Do not keep the wheat idle at one place for long time and temperature of stored wheat should be monitored continuously.

Before taking wheat for milling, miller should ascertain that it should be free from weevils. If infestation is found then fumigate infested wheat for 72 hours & take another batch that is free from any weevils for milling.

Use Emery rolls or scouring machines in the cleaning line & before milling line to clean dirt from the wheat. Generally, insects' eggs are deposited in the crest of the wheat as it is an ideal place for the egg deposition.

Extract all the screenings from the wheat and use clean wheat for tempering and milling. Keep the flour moisture less than 14 % (12.5 to 13.5 % recommended). Use prefumigated packing materials for the flour packing. Always keep the bags/container sealed.

In order to improve the shelf life of the flour, following additional precautions should be taken by millers –:

- Use clean & fumigated wheat for milling
- Use scouring machines in the cleaning line
- Set cleaning machines with optimum efficiency to separate out all the impurities from the wheat
- Clean the dead pockets of the cleaning line frequently, to get rid of non-moving grains at elevator bottom & outlets, wheat conveyor troughs and tempered wheat conveyors.
- Fumigate empty wheat bag .
- Before milling, use scourers to remove dirt in tempered wheat
- Regularly clean the milling equipment like roller mills, feed hoppers, flour conveyors, gravity spouts, plan shifters purifiers, bran finishers, flour bins, flour elevators, flour packing hoppers, bran elevators line, etc.
- Fumigate packing materials before every use
- Frequently fumigate bins & conveyors
- Always keep the packing area & the flour storage area clean
- Building/store entrance should have sliding doors with fine wire mesh to arrest files & insects

- Cover all the water tunnels that are in close proximity to the mill & stores
- Mill & stores surrounding should be free from grass
- Avoid gaps between beams & walls
- It is advisable to smooth finish the walls & roofs to prevent dust adhesion
- Surrounding areas should be cleaned properly
- Used mill spares & sieves must be cleaned and then placed at the store
- Employees should use clean uniforms, hair nets and gloves
- Keep the flour bags closed all the time.
- Flour storage area should be well ventilated
- Keep the packing materials in a hygienic location
- Fumigate the mill with proper sealing annually. However, if you keep the mill, store & process clean, hygienic and well ventilated habitually, you may not be required to fumigate mills & stores.

Expert millers can marvellously improve the shelf life of the flour & maintain the flour quality for longer periods by just one appropriate tool – 'cleaning, cleaning & only cleaning'!

Recently new Bioinsecticide is developed by our parent company muhlenchmie Germany to control Infestation-Namely "EMCEantiBug 9010", it is chemically inert nontoxic white amorphous powder, it is absolutely uncritical to handle.

With grain weevil, 100% mortality can be achieved in two weeks with as little as 2gms EMCEantiBug 9010 per kilogram wheat at 11- 12 5 Grain moisture. Good result have Been observed after dusting an empty grain storage area with about 10 g/m2 and Repeating the treatment with 20 g/m2 after a further 14 days.

EMCEantiBug 9010 powder covers even emerging larvae immediately and dries them Out.

Use in Granaries: The top 30 cm are treated as follows

Prior treatment for prevention infestation: 200 g/m2 ---(1kg/ton)

If infested: 600 g/m2--- (3 kg/ton)

Bulk Goods in powder form (e.g. Flour): The typical dosage of EMCEantiBug 9010 is 0.1-0.2 % is used.

EMCEantiBug9010 increases ash content of the flour

A low moisture content of the flour less than 12.5% enhances the protective effect of EMCEantiBug 9010.

After treatment with EMCEantiBug 9010 the insects are found to have lost their weight and their body fluid content reduced, in some cases. The insects treated with EMCEantiBug 9010 die due to dehydration after a varying time period (depending on Relative Humidity.

Mode of action:

EMCEantiBug 9010 attacks and partially absorbs the wax coat of the weevils. Powder particles of EMCEantiBug 9010 also block the insect's breathing holes (stigma) and in some cases the powder gets build up over the weevil's body. The mechanical effects of EMCEantiBug abrasive particles on the entire locomotors system (joints, cavities and intersegmental parts) impede the insect's freedom of movement and reproductive ability.

Additional information:

1% of EMCEantiBug 9010 binds approximately 2% water and about 1.5 % oil or fat.