**Requirements for Container[[1]](#footnote-2) Fumigation with Phosphine[[2]](#footnote-3)**

**of DDG, Corn and Wheat in Shipping Containers for Viet Nam**

1. Exporters should request federally authorized officials to perform stowage inspection and provide fumigation oversight: Viet Nam requires enhanced pest management practices as a condition for import, including both official inspection of containers before loading and official oversight of fumigation.
2. Official inspectors should make use of the Checklist for Official Inspection of DDG/Corn/Wheat to Viet Nam to confirm that:
* the fumigation site is free from obvious signs of infestation,
* a Pest Management Plan is in place,
* the container is free from debris, moisture, insects, decayed flooring and objectionable odor,
* per label requirements, a written Fumigation Management Plan (FMP) has been prepared by a certified fumigator for each fumigation,
* screening or netting is in place to avoid reinfestation during aeration and
* (for DDG only) monitoring is in place to ensure the below treatment schedule is accomplished.
1. The Fumigation Management Plan for grain fumigations within a shipping sea/land container must include the following considerations:

• Inspection of the container for leaks including mediation suggestions, such as sealing of cracks and holes

• Inspection of the container’s door gasket material to ensure an adequate seal

• The sealing of all vents

• Securing the container with locks and/or placement within a secured facility/area

• The proper dosage rate and amount of fumigant needed – see treatment schedule below

• The application of ample fumigant to achieve the desired concentration as per the PH3 application method determined by the licensed applicator contracted for the fumigation.

• Establishing provisions for time to allow the proper exposure period

• (for DDG only) A predetermined monitoring schedule with readings to be taken at least once every 24 hours.

* + Add-gas procedure
	+ Placement of sampling and monitoring lines to ensure gas concentration readings at commodity center.

• Aeration procedures to include installation and securing of 1.6mm screen material at door and vents.[[3]](#footnote-4)

1. Once the FMP has completed, the licensed applicator should:

• Install monitoring/sampling lines (DDG only)

• Document commodity temperature and confirm treatment schedule

• Seal and prepare the container

• Place placards on both ends

• Apply the fumigant

• Document the time of application and dosage rate.

* (For DDG only) Monitor to ensure the required concentration is achieved and maintained in accordance with the treatment schedule:
* Document time when the minimum required concentration (750ppmv) at commodity center has been reached; this marks time zero when the actual fumigation begins. [[4]](#footnote-5)
* Document concentration at least every 24 hrs (minimum) via electronic equipment such as Drager X-am 5000 with high range (0-2000ppmv) Phosphine sensor or ATI Porta Sense with high range (0-1000ppmv) Phosphine sensor or similar.
* If the concentration needs to be adjusted to assure minimum required concentration level (750ppmv) is maintained, phosphine should be added accordingly via the appropriate delivery system (solid or gas formulations). An official inspection record with the requisite conformity statement[[5]](#footnote-6) will only be issued if:
	+ Phosphine concentration readings at center mass are not less than 500ppmv throughout duration of treatment,
	+ No more than one 24 hour interval reading at center mass is less than 750ppmv.

• Monitor the fumigation perimeter per label and SDS standards (.3 ppmv TWA and 1.0 ppmv STEL) to ensure worker safety with electronic equipment such as Drager PAC7000 PH3 0-20 ppm detector or similar

• Once the desired exposure time has been achieved, don necessary Personal Protective Equipment and crack open the doors and secure appropriate netting using tape/magnets to prevent re-infestation

• Remove seals on vents only if vents are equipped with appropriate screen material

• Monitor concentrations during aeration in accordance with USEPA label requirements

• Once concentration levels are below 0.3 ppmv, remove fumigant residue (if applicable)

• Remove the netting and close the door(s)

• Remove all remaining seals, except for seals on vents unless the presence of appropriate screen material is confirmed (usually on the interior of the container)

• Install seal tag

**Treatment Schedule:**

The treatment schedule should meet the minimum commodity temperature, fumigant concentration and exposure time shown in the below tables. Document the commodity temperature, exposure time (for DDG, time starts once minimum concentration has been achieved at commodity center) and dosage (for DDG, must include PH3 concentration readings). The following exception to the minimum PH3 concentrations (as shown in the below table for containerized DDG) is permitted:

No more than one (1) 24 hour interval reading of PH3 concentration at center mass less than 750ppmv, but never less than 500ppmv at any time throughout duration of treatment.

Applicators are urged not to allow phosphine concentration levels to exceed 2,500ppmv due to adverse impact on insect respiration and fumigant efficacy.

**FUMIGATION SCHEDULE for Containerized DDG[[6]](#footnote-7)**

|  |  |  |  |
| --- | --- | --- | --- |
| Commodity Temperature (C)  | Commodity Temperature (°F)  | Minimum PH3 Concentration Reading[[7]](#footnote-8) | Minimum Exposure Period  |
| 10-15 | 50-59 | 750 ppmv | 5 days |
| 15-20 | 60-69 | 750 ppmv | 4 days |
| >20  | >70  | 750 ppmv  | 3 days  |

Or

|  |
| --- |
| Methyl Bromide is also acceptable and must be used in accordance with the label (including treatment schedule), center mass monitoring and customary FGIS procedures.  |

**FUMIGATION SCHEDULE for Containerized Corn or Wheat**

|  |  |  |  |
| --- | --- | --- | --- |
| Commodity Temperature (C)  | Commodity Temperature (°F)  | Minimum PH3 Application  | Minimum Exposure Period  |
| 10-15 | 50-59 | 45 g/1000 ft3 | 5 days |
| 15-20 | 60-69 | 45 g/1000 ft3 | 4 days |
| >20  | >70  | 45 g/1000 ft3 | 3 days  |

Or

|  |
| --- |
| Methyl Bromide is also acceptable and must be used in accordance with the label (including treatment schedule), and customary FGIS procedures.  |

1. Bulk DDG, corn and wheat fumigation must be performed in accordance with *The Checklist for Official Inspection of DDG/Corn/Wheat to Viet Nam.*  [↑](#footnote-ref-2)
2. Methyl Bromide is also acceptable and must be used in accordance with the label (including labeled treatment schedule) and customary FGIS procedures. [↑](#footnote-ref-3)
3. May not be necessary if alternative such as forced air aeration method is utilized. [↑](#footnote-ref-4)
4. The exposure time must not start until the minimum dose is achieved. [↑](#footnote-ref-5)
5. *The inspected lot conforms to the requirements for (DDGs, Wheat or Corn) for export to Vietnam* [↑](#footnote-ref-6)
6. If exporter chooses to use cylinderized gas for Corn and Wheat, use this table for treatment schedule. [↑](#footnote-ref-7)
7. *An official inspection record may be issued if:*

	1. *Phosphine concentration readings at center mass are not less than 500ppmv* *throughout duration of treatment,*
	2. *No more than one 24 hour interval reading at center mass is less than 750ppmv*. [↑](#footnote-ref-8)