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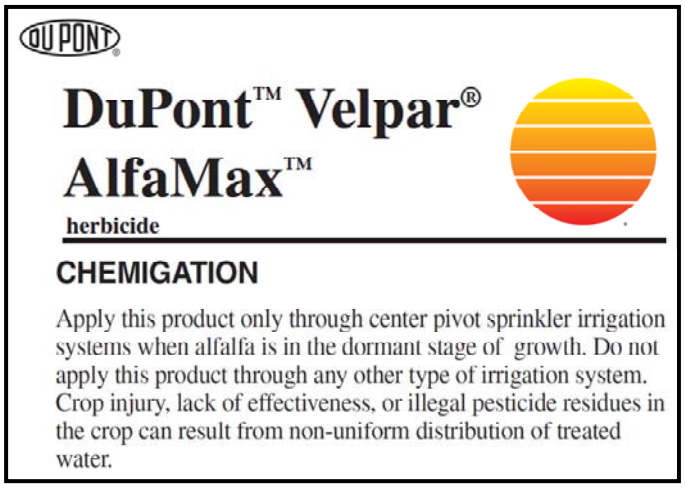
March 30, 2009

Chemigation and Fertigation Technical Assistance Program

Label Interpretation . . . How Close is Close Enough?

USEPA Pesticide Registration (PR) Notice 87-1, the underlying document comprising the chemigation section on pesticides labels, specifies directions for use, safety equipment, and antipollution device requirements if a pesticide is to be applied through an irrigation system (chemigation). The chemigation provision has been required on labels since April 1988 for pesticides authorized by USEPA for chemigation, with the intended purpose to protect human health and to safeguard the environment.

A provision in PR Notice 87-1 requires product registrants to list the type of irrigation system(s) through which the product may be applied. After the listing of irrigation systems, PR Notice 87-1 requires that the section end with the statement, "Do not apply this product through any other type of irrigation system."



DUPONT

DuPont™ Velpar®
AlfaMax™

herbicide

CHEMIGATION

Apply this product only through center pivot sprinkler irrigation systems when alfalfa is in the dormant stage of growth. Do not apply this product through any other type of irrigation system. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.

Figure 1. Label provision listing authorized irrigation systems.

Sometimes a label, as with Velpar® AlfaMax™ (Figure 1), will list center pivot but not linear (lateral) move. Nonetheless, can AlfaMax™ be applied though a linear move irrigation system (Figure 2)?

Figure 2. Linear (or lateral) move irrigation system.

The answer is "No." Arguably, the superstructure of a center pivot and linear move irrigation system are fundamentally the same, and components are common to both. And, they are operated similarly.

The directive statement "Do not apply this product through any other type of irrigation system" limits application only thorough a center pivot, since linear move is not listed as an authorized system.

> PR Notices are issued by the USEPA Office of Pesticide Programs to inform pesticide registrants and other interested persons about important policies, procedures, and regulatory decisions.

Mocap EC Granted a SLN Registration for Hops

On March 12, a Washington Special Local Need (SLN) registration number WA-090008 was issued to Bayer CropScience for the use of Mocap EC Nematicide-Insecticide (USEPA Reg. No. 264-458) through surface drip and subsurface drip irrigation systems in hops. The hop industry requested the SLN labeling for the control of *Prionus* beetles.

A special local need is an existing or imminent pest problem within a State for which the State lead agency, based upon satisfactory supporting information, has determined that an appropriate federally registered pesticide is not sufficiently available. WSDA is the designated lead agency in Washington State for the regulation of pesticides.

An SLN or 24(c) registration allows a State to register additional uses to those already listed on the federally registered label. SLN registrations may include, in part, new method or timing of application, new crop, new pest, less hazardous formulation, change in application rate, or application to a particular soil type.

WSDA has the authority under Section 24(c) of FIFRA to register an additional use of a federally registered pesticide product, or a new end use product for use (refer to 40 CFR Section 162.152[b][2]) in "special local need" situations. These registrations, reviewed and issued by WSDA, become federal registrations under Section 3 of FIFRA, but can only be distributed and used within Washington.

Operation and Maintenance Plan

The SLN requires that the chemigation equipment must be properly maintained, and that the chemigation system be inspected prior to the application to ensure integrity and operational performance. Verification is required in the form of a current, site-specific Operation and Maintenance Plan. The provision will likely begin to appear with ever-increasing frequency on pesticide labels. As a case in point, preparation of a Soil Fumigation Management Plan is one of the stipulated USEPA mitigation measures in the reregistration of the metam-derivative soil fumigants.

An Operation and Maintenance Plan must:

- ✓ be site-specific;
- ✓ be in a printed form;
- ✓ provide specific instructions on operating and maintaining the injection apparatus and irrigation system so as to ensure their proper function; and
- ✓ be in the immediate possession of the applicator(s) throughout the application.

Although not required, the Operational and Maintenance Plan may include the following items with the intent to ensure handler and bystander safety and environmental protection.

1. Full pesticide label, product MSDS, and applicable supplemental labeling;
2. Drawing, topographical map, or aerial photograph of treatment area on which the following features are identified:
    a. Sensitive areas within or adjoining the treatment area,
    b. Field access points,
    c. Placement of field posting signs; and
    d. Emergency decontamination site.
3. Description of backflow prevention system, which must be compliant with the pesticide label and the Washington State Chemigation Rule;
4. Documentation that the injection system is compliant with the pesticide label and the Washington State Chemigation Rule;
5. Documentation that backflow equipment and injection apparatus have been examined prior to the application and are operating properly;
6. Guidelines for scheduled inspections and a procedure to verify proper operation of injection and irrigation system devices.
7. Notation when malfunctioning or damaged devices were detected with a description of the corrective action that was undertaken.
8. Description of calibration procedure;
9. Record of periodic recalibrations (Figure 3);

Figure 3. Throughout an application, the injection system should be periodically recalibrated to verify the application rate.

Figure 4. A written record of application site observations and meteorological readings should ideally be maintained.

10. Description of monitoring procedure to assess operation of the injection and irrigation systems (Figure 4);
11. Description of safety procedures (administrative and engineering controls) to minimize human exposure and environmental contamination;
12. List of required personnel protection equipment;
13. Restricted entry interval (REI) and the date that the REI expires;
14. Procedure for flushing the injection apparatus and irrigation system, including the duration of the flush time;
15. Emergency mitigation measures in the event of worker, handler, or bystander exposure; and
16. Notification and response procedures involving product spills, human exposure events, and releases to surface or into ground water.

Most of these items should exist in an emergency response plan for a farm or an agrochemical company. Finally, applicators as well as anyone else involved in the application process should understand the content of the plan, as well as their role and responsibility within it.

Remember: A copy of the SLN must be in the applicator's possession throughout the application.

Emission Uniformity vs. Distribution Uniformity – Same Thing, Different Irrigation Method

Application uniformity is a measure of the uniformity in which irrigation water is distributed to areas throughout a field. It is determined, primarily, by irrigation system design as well as how the irrigation system is operated and maintained. It must be emphasized that a measure of application efficiency of a single event (on a specific date) or a specific location in a field is not indicative of an entire field or overall seasonal efficiency. Many factors can affect uniformity across a field or throughout a season.

Two measures are customarily used to assess application uniformity of an irrigation system: Christiansen's Coefficient of Uniformity (CU) and Low Quarter Distribution Uniformity (DU_{lq}). Coefficient of Uniformity averages water application of the entire area and gives equal emphasis to over watering as to under watering. DU_{lq} differs from CU in that it treats under watering as a more significant problem than over watering. Weighing the significance of problem areas, DU_{lq} is the generally accepted measure of application uniformity.

DU_{lq} is the ratio of the average of the lowest one-fourth of measurements of irrigation water applied to the average depth of the total irrigation water applied. Calculation for DU is illustrated in Figure 5.

$$DU_{lq} = \frac{\text{Average low-quarter depth of water applied to plants in a field}}{\text{Average depth of water applied to plants in a field}} \times 100$$

Figure 5. Equation to calculate Low Quarter Distribution Uniformity.

As a uniformity measurement, central to the definition of DU_{lq} is whether all plants receive similar amounts of water. A requirement of a sprinkler irrigation system is whether all areas of a field uniformly receive similar amounts of water, since plants uniformly cover the surface of the field. However, in orchards, vineyards, or hop yards, a DU_{lq} would not require that ever point of a field receive the same amount of water as long as each plant of the same size receives the same amount of water. The procedure for evaluating an irrigation system depends, in part, upon the crop that is being irrigated.

To quantify differences in uniform coverage requirements for different types of irrigation systems, the term "emission uniformity" (EU) is often used instead of DU_{lq} for microirrigation. (Microirrigation includes methods of irrigation that use point-source and line-source emitters, such as drip and subsurface drip). EU_{lq} should be computed the same way as DU_{lq}.

In citing performance criteria for irrigation devices, the Washington State Chemigation Rule (WAC 16-202-1003[14]) references established industry standards (international or national) or manufacturer's specifications. Recognized industry standards include, but are not limited to, International Organization for Standardization (ISO), American Society of Agricultural and Biological Engineers (ASABE), American National Standards Institute (ANSI), and the American Society of Civil Engineers (ASCE). When standards have not been officiated by professional societies or organizations, federal practice standards or accepted agency directives are cited.

In referencing performance criteria for microirrigation systems, WSDA acknowledges USDA National Resource Conservation Service (NRCS), Conservation Practice Standard, Code 441: Irrigation System, Microirrigation as the nationally recognized standard. USDA-NRCS Practice Standard 441 recommends an Emission Uniformity (EU) of 85 percent or higher for a microirrigation system. The practice standard may be viewed at <ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/441.pdf>.

Mocap® EC and Metam Sodium . . . The Inference of a Product Bulletin

With supplies of 1,3-dichloropropene (Telone) in short supply this spring, growers are considering alternative strategies to manage the nematode complex. One option being considered is tank mixing Mocap® EC (Bayer CropScience; USEPA Reg. No. 264-458) with metam sodium/potassium products.

While not a new or even a novel practice, applicators have been uncertain as to origin or source of the recommendation. Some thought the tank mix was an authorized use on the federal (Section 3) label, while others surmised Special Local Needs labeling. In fact, it is neither. Reference to the tank mix appears in registrant-issued Product Bulletin, specifically, a Section 2(ee) label addition to Mocap® EC.

FIFRA (Federal Insecticide Fungicide and Rodenticide Act, the federal pesticide legislation) as well as State laws and rules prohibit an applicator "to use any registered pesticide in a manner inconsistent with its labeling." Alternatively written, an applicator cannot use a registered pesticide in a manner not permitted by its labeling. However, certain deviations from the label are permitted, unless the label specifically forbids the deviation.

FIFRA Section 2(ee)(3) allows "any method of application not prohibited by labeling." A similar provision appears in the Washington State General Pesticide Rules (WAC 16-228-1225: What are the exceptions to label requirements?). Within the context of both regulations, seven legal deviations to label provisions are allowed. Two of these deviations that are relevant to this article are considered below.

Changing the method of application: Any method of application not prohibited by the labeling can be used unless the labeling specifically states that the product may be applied only by the methods specified on the labeling. (**Note: This deviation does not apply to the chemigation.**) The Mocap® EC label neither prohibits shank application nor limits any other method of application.

Tank mixing of two or more pesticides: Unless a mixture is prohibited by the labeling of either product, the products (whether another pesticide or a fertilizer) can be tank mixed. Although the product bulletin lists specific metam-derivative products, tank mixing of Mocap® EC is not restricted to those products – as long as the metam-derivative soil fumigant does not prohibit Mocap® EC as a tank mix. **Remember:** All applicable directions, restrictions, and precautions listed on all of the USEPA registered labels must be followed.

> Section 2(ee) label additions are not enforceable. They are recommendations provided by the registrant as guidance in the use of a product.

WSDA neither registers nor tracks Section 2(ee) label additions. Product bulletins may be downloaded from electronic label databases (such as CDMS) or obtained from a product representative.

Application Tanks . . . When Size does not Matter

Figure 6. Identification information must appear on all application tanks, regardless of the size and content(s).

Simply stated, with a chemigation or fertigation system, an application tank is an application tank, and no distinction is made as to size, shape, color, or manufacturer. Furthermore, identification requirements are the same whether the application tank is 20 gallons in volume, or 6,500 gallons (Figure 6).

While seemingly a minor oversight, failure to place all of the identification information on an application tank, regardless of its size, is a violation of Washington State Chemigation and Fertigation Rules and, possibly, of FIFRA. (For chemigation, FIFRA requires that the full pesticide label be affixed to the tank and that the net capacity be indicated in some manner on the tank.) Identification information must be placed on each application tank (Figure 7).

Tank identification must include the following:

- ✓ Contact name
- ✓ Contact phone number
- ✓ Unique identifier
- ✓ Net volume
- ✓ Full pesticide label (Chemigation)
- ✓ List of primary contents (Fertigation)

To enhance visibility, identification information (except for the pesticide label and primary contents) must be at least two inches in height and must be of a color that contrasts with the background onto which it is placed.

Figure 7. Identification information must appear on each mini-bulk container, even if the containers are manifolded together.

The phone number must be in-service. Moreover, the contact must be aware of the application and familiar with its location.

Application tank identification requirements for chemigation are listed in WAC 16-202-1007, and WAC 16-202-2004 for fertigation.

Reminder about Enclosed Cabs and Respirator Use

In the February 25, 2008, issue of AG-ASSIST-WSDA, an article examined a reassessment by Washington State Labor and Industries and WSDA of the USEPA respirator exception in the Worker Protection Standard about wearing a respirator while inside a tractor cab. As written in the article, USEPA previously credited an enclosed cab exception given that the cab ventilation system provided equivalent respirator protection to the pesticide label-required personal protection equipment (PPE).

Figure 8. A respirator must be worn while in a tractor cab if the pesticide label requires an applicator to wear a respirator.

To qualify for the USEPA respirator protection equivalency exception, the manufacturer must provide a written declaration that 1) the cab conformed to the testing procedure and performance criteria as described in ASABE Standard S525 and 2) specifies to what respirator equivalency the cab was certified. Furthermore, documentation must verify compliance with Labor and Industries cab certification program. Currently, cab certification programs are not supported by cab manufacturers or by Labor and Industries, nor will they likely be in the future (Figure 8).

VAPAM® HL

SOIL FUMIGANT

A SOIL FUMIGANT SOLUTION FOR ALL CROPS

Applicators and other handlers performing direct-contact activities must wear:

- Coveralls over long-sleeved shirt and long pants
- Waterproof gloves
- Chemical-resistant footwear plus socks
- Chemical-resistant headgear for overhead exposure
- Chemical-resistant apron when cleaning equipment, or when mixing, or transferring without dry-disconnect fittings
- Face-sealing goggles, unless full-face respirator is worn
- A respirator with either an organic vapor-removing cartridge with a pre-filter approved for pesticides (MSHA/NIOSH approved number prefix TC-23C) or a canister approved for pesticides (MSHA/NIOSH approved number prefix TC-14G)

Figure 9. Vapam HL label requires that a respirator must be worn during a direct-contact task, which includes application of the product.

For the respirator equivalency exception to apply for the organic vapor soil fumigants, the cab must be certified by the manufacturer and by Labor and Industries to provide respiratory protection equivalency to "either an organic vapor-removing cartridge with a pre-filter approved for pesticides (MSHA/NIOSH approved number prefix TC-23C) or a canister approved for pesticides (MSHA/NIOSH approved number prefix TC-14G)" (refer to Figure 9).

However, enclosed cabs do not need to be certified for dermal protection. Therefore, an applicator may wear "long-sleeved shirt, long pants, shoes, and socks" in place of the other PPE. All of the label-specified PPE must be immediately available to the applicator and be stored in a chemical-resistant container. If the applicator must leave the cab to perform a task that will result in contact with pesticide residue or the product, the applicator must don the PPE before undertaking the activity.

In summary, the USEPA enclosed cab exception for equivalent respiratory protection is no longer valid in Washington State, given the infeasibility of the dual certification requirement. If the pesticide label requires respiratory protection, the applicator must wear the label-specified respirator while in the cab.

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