

## PALADIN® U.S. REGISTRATION AND UPI PALADIN® SOIL FUMIGANT PROGRAM

C. D. Owens, United Phosphorus Inc. (UPI)

Paladin® and Paladin® EC (Dimethyl disulfide; DMDS), a novel, pre-plant soil fumigant that controls weeds, soil-borne plant pathogens and nematodes, has received U.S. registration by the United States Environmental Protection Agency (EPA) July 9, 2010. Paladin® is developed and distributed by United Phosphorus, Inc. (UPI) in partnership with the Paladin® registrant, Arkema Inc. Paladin® is a new and effective soil fumigant for the replacement of methyl bromide.

Since 2004, Paladin® soil fumigant's efficacy and crop safety have been assessed and confirmed through extensive R&D studies with over 250 field trials in 15 countries. From 2007–2010, extensive research was conducted on the use of Paladin® through an EPA-approved Experimental Use Permits (EUP). Results from many of these trials have been presented at previous MBO conferences.

Paladin® is the only soil fumigant on the market that contains an EPA signal word of "WARNING"; other registered soil fumigants have the signal word "DANGER". Paladin® is not mutagenic, a skin sensitizer, a developmental toxin, a reproductive toxin, nor a suspected carcinogen.

Paladin® soil fumigant is a RESTRICTED USE PESTICIDE and will be for retail sale to and use only by Certified Applicators or persons under their direct supervision. Prior to the start of fumigation, the Certified Applicator supervising the application must verify that a site-specific FMP exists for each application block.

Paladin® is labeled for a pre-plant application in tomatoes, peppers, eggplants, cucumbers, squash, melons, blueberries, strawberries, field-grown ornamentals and forestry nursery crops. Label requirements will include a listed approved VIF type plastic mulch for all Paladin® and Paladin® EC applications. Planting intervals following application will be determined based on mean daily low soil temperature at an 8" depth.

A Paladin® program will consist of Paladin® tank mixed with chloropicrin (PIC) for a 79:21 wt/wt ratio recommended at 50 – 60 gallons per acre or Paladin® EC tank mixed with PIC for a 79:21 wt/wt ratio recommended at 55 – 63 gallons per acre. UPI also recommends applying an appropriate pre-plant herbicide, such as Devrinol® herbicide, to the finished bed surface pre-plant non-incorporated just prior to laying the plastic mulch to

increase the control of small-seeded broadleaves and grasses. See Devrinol<sup>®</sup> label for approved crops and rates.

DMDS has a strong odor which can be detected at concentrations significantly below the levels that can potentially cause harm. A number of practices can be followed to mitigate the odor, as well as to address worker and bystander exposure. Several of the recommended preventative measures include:

- Insure soil moisture is greater than 75% field capacity and preferably closer to 100% depending on soil type.
- Insure beds are firm.
- Insure shanks are in the soil prior to injection at start of row.
- Cut off injection prior to stopping at the end of the row.
- Purge injection lines prior to raising shanks from soil.
- Treated soil should not be disturbed after application.
  - Squaring of end rows, water furrows and cutting lanes should be accomplished in untreated soil.
- Contact your local 1<sup>st</sup> responders (Police, Fire, and Emergency Medical Technicians – (EMT)) and propane or natural gas companies prior to application to advise you are applying Paladin<sup>®</sup>. Arkema Inc. has prepared community outreach and 1<sup>st</sup> responder information that can aid with notifications.

Paladin<sup>®</sup> commercial use is pending state registrations and UPI is anticipating limited applications prior to the end of 2010 and full scale use for the 2011 season. Paladin<sup>®</sup> will be an important alternative to methyl bromide for growers utilizing a plastic culture production system.

Devrinol<sup>®</sup> is registered trademark of United Phosphorus, Inc.  
Paladin<sup>®</sup> is a registered trademark of Arkema Inc.