



INFORMATION ON RESEARCH SUPPORTED BY THE CALIFORNIA TREE FRUIT AGREEMENT

October 3, 2005, Vol. IX-4

 Contact: Gary W. Van Sickle, Research Director
gvansickle@caltreefruit.com

Fumigation Update

 Contributed by Mike McKenry, Kearney Ag. Center
MCKENRY@uckac.edu (559) 646-6500

Telone II is the fumigant of choice, but stone fruit growers need a way out of the California surface moisture requirement. Some autumns there is adequate September/October rainfall providing surface moisture, and in other years there is not. **Telone II** at 330 lb/ac will not be efficacious enough if applied to soils with deep moisture or generally after Nov. 15. **Telone C35** at 500 lb/ac can be substituted for 330 lb/ac **Telone II** but it is more expensive and barely enough **chloropicrin** is applied via this mixture. Phytotoxicity problems to newly planted stone fruits can sometimes develop if **chloropicrin** is applied after Nov. 15.

Telone II applications do not adequately treat the surface 3 inches of soil. Where nematodes are of serious concern the application of 110 lb/ac **metam sodium** or 80 lb/ac **metam potassium** in front of a roto-till device will adequately treat the surface 5 inches of soil. This combination treatment performs as well as a tarp application at ¼ the price.

In-line is emulsified **Telone II** plus **chloropicrin** applied via drip. It works well when delivered with uniformity across the field, a difficult task in loamy sands unless there is one drip emitter for every square foot of field surface. It is more expensive than shanked **Telone II** and adds into the same township caps as **Telone II**.

Metam sodium or **metam potassium** at 330 lb/ac (75gpa) can be used as a drench or basin application. It is the least expensive fumigant. Stone fruit growers with short rows (1/8 mile) and no slope can develop whole row basins (need >

400gpm water supply) where it is applied within 6 to 8 inches of water. However, this would usually be a springtime application and there must be at least 12 months time between application and planting or stone fruit trees do not grow well. **Metam sodium** or **metam potassium** applied via basins do not currently encounter a California buffer zone requirement and it is relatively odorless when applied via basins.

Dazomet and **Basamid** are granular formulations that release the same active ingredient as **metam sodium** but their comparative cost is roughly three-fold. We have not observed the same poor growth problems of stone fruits after these products that we have observed when following **metam sodium**. The granule is useful but its rate of release and the method of release from the granule is not predictable like it is in the liquid formulation, **metam sodium**. There may be a future use for this product but its activation, once applied, is via sprinkler applications, a tool not very common among stone fruit growers. Microsprinkler irrigations after strip or tree site applications of the granules may have utility in the future.

Chloropicrin at 330 lb/ac can replace **Telone II**. It must be applied deep (20 to 28 inch shank placement) or accidental off-gassing will encounter local county regulations. Used alone **chloropicrin** is nematicidal; it is a great remedy for the replant problem, but it is not the best root killer and may not penetrate as deep within soil. It is 3 times the cost of **Telone II**. Thus, it does not replace **Telone II** but is a great compliment to the use of **Telone II**. Additions of 150 to 200 lb/treated acre (strip applications) along with **Telone II** provide great

growth benefits, particularly useful where the replant problem is greatest.

Methyl Bromide is a great all round, highly flexible, soil fumigant that is currently as expensive as **chloropicrin**. Stone fruit growers need it for sites with Oak Root Fungus, sites that are of finer soil texture, or those sites treated after November 15.

Iodomethane is a new product (**methyl iodide**) with no current commercial experiences. Certain scions including pluot, plum, prune, and cherry can exhibit iodide phytotoxicity. Peach and nectarine cultivars also exhibit foliar symptoms if the application rate is above 235 lb/ac. First year plant damage can be dramatic in certain areas of the field but at 200 lb/ac **methyl iodide** applied to sandy loam soils this phytotoxicity problem can disappear in the second year. We have not observed this problem in clay loam soils, but it does occur in some sandy loam soils and this problem has not yet received evaluation in loamy sand soils. This product is a **methyl bromide** replacement and generally accomplishes all that **methyl bromide** accomplishes, but at 80% of the application rate. Stone fruit growers who have observed the value of 350 lb/ac **methyl bromide** will see similar performance using **iodomethane** at 80% of that rate (280 lb/ac). Few stone fruit growers have applied 300 lb/ac methyl bromide but they will see similar performance using 240 lb/ac **iodomethane**. Where nematodes are of concern, 275 lb/ac **methyl bromide** is an inadequate treatment rate. Do not expect 220 lb/ac **iodomethane** to perform any better. The proposed top label use for **iodomethane** is 235 lb/ac and its cost is still unknown. At 235 lb/ac **iodomethane's** use will be limited to strip applications where the replant problem exists but deep-dwelling nematodes are of minor concern. This product may be an option where it is too late in the season for use of **Telone II** or **Chloropicrin**.

The choice of strip treatments vs broadcast treatments is a money saving option. Strip treatments (10-11 feet wide) are a great solution to the rejection component of the replant problem, but strips are not a solution to soil pest problems such as nematodes. If there is no resistance to prevailing

soil pests in the rootstock to be planted, then use broadcast applications. If the site is a replant but no real pest problems exist, application of the fumigant as a strip application is all that is needed.

Roundup® Resistant Horseweed

Contributed by Anil Shrestha, Kearney Ag. Center
anil@uckac.edu (559) 646-6500

The development of herbicide resistance by weeds is not a new phenomenon. It is a naturally occurring evolutionary process in response to a selection pressure, i.e. herbicides. There are currently 297 different herbicide-resistant weed biotypes globally, of which 27 biotypes are of *Conyza canadensis* (horseweed or mare's tail). The first case of herbicide-resistant horseweed occurred in Japan in 1980 to paraquat. Since then, horseweed has developed resistance to six different classes of herbicides, including the glycines (glyphosate – a Group 9 herbicide). To date, all cases of glyphosate-resistant horseweed have occurred within the United States, with the first case documented in Delaware in 2000. By 2005, glyphosate-resistant horseweed has been found in 11 different states, including California (Northern Tulare County - July 2005).

In the case of California, resistance evolved due to the repeated use of glyphosate over a number of years along hundreds of miles of irrigation canal banks. Glyphosate is a broad-spectrum herbicide that provides effective control of most weeds and is the most commonly used weed control product in the world. Glyphosate is the active ingredient in Roundup®, Touchdown®, and dozens of other generic brand products registered in California. In order to maintain the effectiveness of glyphosate in California, it is imperative that growers, PCAs, and others prevent herbicide resistance and recognize when resistance is occurring and implement tactics to resolve it as soon as possible, such as avoid using the same herbicide or herbicides with the same mode of action year after year. Also, make applications at the optimum time for control (correct weed growth stage and size) using the recommended label rate for the most difficult weeds in your field. Refer to www.weedscience.org for additional information regarding resistance.