

## QUESTIONS ABOUT SUGARBEETS

1. Prior to April 1990, what % of the acres were treated with 1,3-dichloropropene?  
In 1988, 228,292 acres were planted to sugarbeets (source California Farmer); and 22,101 acres were treated with 1,3-D (source CDFA Pesticide Use Report) = 9.68%
2. What was the usage pattern over the five years prior to April 1990?  
I don't have these figures but I would estimate 10% of the acreage was treated each year.
3. What is 1,3-dichloropropene primarily used to control (target pests)?  
sugar beet cyst nematode (Heterodera schachtii), root knot nematode (Meloidogyne incognita, M. javanica, M. arenaria, M. hapla), rhizomania.
4. How (method) is it applied?  
Shank injection either broadcast (12-18 inches between shanks injected 12 to 18 inches deep) or row (1 or 2 shanks per bed).
5. When is it applied? (Point in crop cycle and dates); how many applications?  
Preplant at least 2 weeks before planting. One application per crop anytime of the year soil temperature and moisture conditions are in a tolerable range.
6. Rate:  
Varies with soil texture, broadcast rate would be approximately 20 gallons per acre, row treatments would be 10-12 gallons per acre.
7. What were 1,3-d (Telone II) chemical alternatives used in California prior to April, 1990?  
metam-sodium (Vapam, Soil Prep, Sectagon II), aldicarb (Temik). Since? same.
8. What was the market share for each of the alternatives prior to April 1990?  
Don't know, I would estimate virtually nothing for metam-sodium, and 10% for aldicarb (for nematode control). 1988 Pesticide Use Report indicates 18,181 acres treated with aldicarb. However, much of this was probably used for insect rather than for nematode control. Since? 1990 CDFA Pesticide Use Report indicates 4,612 acres for 1,3-d (January to mid-April); 300 acres for metam-sodium; and 22,160 acres for aldicarb. According to the California Beet Growers Association and Farm Advisors, growers are planting crops other than sugarbeets in fields known to be infested with nematodes or rhizomania. Processors are working to shift acreage from southern and central California where sugarbeets have traditionally been grown and fields have become heavily infested to northern California (Modoc and Siskiyou counties).
9. How effective are these chemicals relative to 1,3-D (Telone II)? Drawbacks?  
Comparative effectiveness would vary with each situation. Under ideal circumstances, metam-sodium would provide similar nematode control plus fungal and weed control; aldicarb would provide similar nematode control plus insect control.

Under most circumstances nematode control with either one would be less than with 1,3-d. Metam-sodium is an excellent nematicide if it can be gotten to the nematode, however, it has traditionally given inconsistent results.

At a high enough concentration, aldicarb will kill nematodes; at lower concentrations, it only disorients or paralyzes them for a period of time. At even lower concentrations it will stimulate nematode reproduction. Drawbacks would be: greater acute toxicity to workers, lower efficacy, greater potential for groundwater contamination (aldicarb only), greater potential for harm to endangered species and other nontarget organisms.

10. Do you have any articles on efficacy of Telone or alternatives for control of root knot nematodes on sugarbeets?

Two are included.

11. Treatment regime for alternatives

Metam-sodium

Rate: 75-100 gallons per acre

# of treatments: one per crop, preplant

Type of equipment-shank, sprinkler, flood irrigation

# of days per treatment-1, at least 2 weeks before planting

# of acres treated - don't know

aldicarb (Temik 15G)

Single applications, at planting or within one week before planting - 14 pounds/acre in a 4 to 6 inch band where seeds will be planted; or at planting plus postemergence split application - 14 pounds/acre at planting and 14 at postemergence; or postemergence not to exceed 28 pounds per acre in 14 acre increments applied within 30 days of planting. All this is on the label.

Type of equipment: granule applicator

# of acres treated - don't know

12. What non-chemical controls were used prior to April 1990? Since?

Approximately 30% of the acres traditionally used for sugarbeets is infested with sugarbeet cyst nematode. Crop-rotation has traditionally been used for managing this nematode (3-4 years in southern California; 8-10 years in central California plus the use of 1,3-d). Crop rotation is still being used. Because of its wide host range, crop rotation is not recommended for root knot nematode (except rotation with nematode resistant processing tomatoes). I haven't heard of any changes in non-chemical control practices since April of 1990 other than not growing sugarbeets in ground known to be infested with nematodes. Research is in progress on trap crops which have reduced sugarbeet cyst nematode populations by approximately 50% in Germany. To date in California we have had variable results possibly due to genetic differences between this nematode within the state and with the same species found in Germany.

13. What has been the impact of suspending 1,3-D (Telone II, Telone C-17)?

Increased crop loss due to nematodes (and rhizomania), fewer acres planted in traditional growing areas, shifting of acres from southern and central to northern California. Increased interest by industry in expanding existing registrations (or developing new registrations) of organophosphates to this crop since they no longer have to compete with a more effective material.

14. What added effects would cancellation have?

More of the same leading to greater acute environmental problems and potentially loss of this \$213 million dollar (farm gate value only) industry and associated jobs in California.

15. What would be the impacts of also cancelling methyl bromide, temik, and/or furadan, Vapam (in combination and separately)?

Furadan is not registered for nematode control on sugarbeets in California. Methyl bromide is not registered for use on sugarbeets in California.

Research is in progress to develop equipment to improve distribution of metam-sodium and increase effectiveness. Inconsistent results have been experienced in trials to date. Last year I assisted with two Vapam trials for root knot nematode on sugarbeets. Both used similar rates and application techniques. The first trial in Tulare county with Farm Advisor Carol Frate was very successful. The second trial in Yolo county with Tom Babb from Spreckels Sugar was a disaster.

Length of rotation to nonhost crops will increase. Acreage would continue to diminish and/or shift to northern California. Land in northern California will eventually become infested with nematodes and/or rhizomania. At some point acreage will become small enough that processors will increase operations in other states or we'll all be eating cane sugar.

Farm Advisor Emeritus Franz Kegel (San Joaquin County) said he would be happy to answer your questions and to call him at home: 209-931-1643.

Farm Advisor Carol Frate in Tulare County would be another good source of information: 209-733-6363