Conventional and organic alternatives to methyl bromide on California strawberries.

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Fourth year field experimentation with alternative soil fumigants and various non-chemical soil amendments for str production on the Central California Coast have yielded repeated trends common to studies in 1995, 1996 and 199 previous results have been reported at MBAO annual meetings, and have been published in the literature or are in preparation by these authors. 1998 season results are discussed as follows:

1. Site description: Successive years studies were initiated on our research farm on the California Central Coast wh studies were conducted on land fallowed for 3 years prior to planting. Concomitant with this first year strawberry pla this site, the adjacent 2 acres were planted in cover crops that were continuously managed in alternations of Hairy *Phacelia*. One acre of this area was planted to strawberry tests in the fall of 1996, and the second acre planted in t 1997. Thus, the 1996 data reflect results from treatments on previously fallow land; the second years 1997 results land previously fallowed and then composted and cover-cropped for one year; and these third year results represe soil conditioning series with an additional year of composting and cover-cropping prior to planting for the 1998 seas

2. Alternative chemical fumigation. In 1996, 1997 and 1998, several chemical fumigants were tested in comparison bromide/chloropicrin for performance under field conditions. Following fumigation, the highly disease susceptible U Chandler (used in 1996) and Camerosa (used in 1997 and 1998 studies) were planted into a clay soil (52%) and gr yield parameters recorded. Across all years, the best performing fumigant was Telone/Chloropicrin at 30-35% chlo These results were consistent for this soil type among the years, as well as a sandy loam site used for our first stud In addition to Telone/chloropicrin, data for metham sodium indicated relatively good control of soil diseases under application conditions in this clay soil, but not in the sandy loam used in 1995. By contrast, performance of Telone/ was not impacted by soil type and yields were only 5-8% less than those of methyl bromide/chloropicrin.

3. Organic soil amendments. In all years, alternative soil treatments included either non- chemical methods to dire plant pathogens in soil prior to planting, or building the soil foodweb to the extent that the rhizosphere was suppres these same pathogenic microorganisms. These soil treatments included *Brassica* residues (shredded broccoli plan rates of compost, and VAM (Vesicular-arbuscular mycorrhizae) inoculation. Our four years of results with *Brassica* in light and heavier soil types show that while pathogenicity of soils are somewhat reduced, a single preplant soil a shredded *Brassica* is not sufficient to maintain roots pathogen free into the season. In these plots, yield was signifi reduced over conventional fumigation and usually only slightly better than untreated soil without fumigation or orga amendments. This result was consistent for the entire four year period of these trials, with broccoli mulched into be previously fumigated soil, fallowed soil, soil cover cropped for 1 and 2 years prior to planting, and broccoli used wit without high rates of compost. None of the conditions of these studies yielded significant disease reduction or signi increases to the extent necessary for commercial adoption with California strawberries.

With regard to utilization of compost for building microbial diversity and a suppressive soil environment, the three s yield results at this same site vary depending on the history of the soil prior to planting. In the 1996 studies with soi history of conditioning and

instead was fallowed three years prior to planting, compost application at high rates with VAM inoculation had bene effects on fruit production. Second year results (1997), where soil had one year of conditioning prior to planting, co and VAM inoculated plots differed only 28 flats of fruit per acre from the methyl bromide standard. Compared to ur this difference also favored VAM and compost with an average 216 additional flats of fruit per acre. In these 1998 r presented here, smaller differences occurred from the addition of compost, and almost no benefit on either bare ro plants from inoculation with VAM.

4. Alternative plug plants. Conventional strawberry runner plant production involves growing high populations of fie plants in Northern regions of California, digging vernalized daughter plants, placing them into burlap sacks or other and sorting and separating them out at a secondary location elsewhere in the state. These plantlets have bare root with ro[FBARE ROOT ets broken, and are maintained moist and at cool temperatures to minimize injury until plan contra re a new development by a few eastern growers, where strawberry runner plants are set int

trays and grown out in artificial potting mix similar to vegetable transplants. They are planted by hand as are conve
plants, but receive less wounding and shock at planting than conventional bare root technology. As a result, they ir
growth faster and achieve higher seasonal yields than conventional bare root daughters. In our trials with UC cultiv
West Coast, they also consistently perform very well in non fumigated soil. Plug plants grown properly and planted
fumigated soil achieve yields comparable to conventional bare root plants grown in methyl bromide fumigated soil.
are shown for the current 1998 yields, however, similar results were achieved in previous years with these same so
conditioning treatments and plant types.

Figure 1. Average seasonal yields from organic soil amendments and alternative strawberry transplants, compared
conventional production that relies on methyl bromide/chloropicrin fumigation and bare root transplants. *Arroyo Gra
CA. Spring 1998*.