

## 2008 OPTIONS FOR STRAWBERRIES IN NON-FUMIGATED LAND

Dr. Frank Louws, Extension Plant Pathologist

Dept. Plant Pathology, North Carolina State University, Raleigh NC 27695

Continuous rain leaves many growers without the time needed for fumigation. In most cases, it is better to plant on time and not fumigate, than to fumigate and plant 2 weeks late. Research has demonstrated that delayed plantings can substantially reduce yield potential.

Below is a table compiled from research efforts in eastern North Carolina. On average, non-fumigated land had a 75% yield compare to MB treated land. In our experience, land that was subject to good crop rotations and best management practices (eg. cover crops, good drainage etc) generated yields in the 85-95% range. Heavy soils will experience higher yield losses than light soils, except in cases with high nematode populations. In the Mountains in Western North Carolina, we have not been able to show a benefit due to fumigation in two 2-yr trials.

In all cases, lack of fumigation leads to more weed pressure from small-seeded winter annuals and non-fumigated land may require more hand weeding, usually in late fall and again in the early spring.

Table 1. Estimated average yield associated with alternatives fumigation treatments: Piedmont and Coastal Plain region of North Carolina (represented locations are Plymouth, Clayton, Bunn) and Vidalia, GA.

Fumigation Alternative	Average Marketable Yield (lbs/acre)	Years Represented (cumulative yrs of research)	Locations Represented
Chloropicrin	28,377	2000 – 2001 (2)	Plymouth
Telone-C35	26,806	1996 - 2001 (15)	Plymouth, Clayton, Bunn, Vidalia
Methyl bromide	26,673	1996 - 2001 (15)	Plymouth, Clayton, Bunn, Vidalia
Metam sodium (shank)	26,604	1996 - 2001 (9)	Plymouth, Clayton
Non-fumigated	20,010	1996 - 2001 (15)	Plymouth, Clayton, Bunn, Vidalia

Growers who must plant without fumigation have a few additional options. We have done considerable work to determine the main problems on strawberry roots in fields that were not fumigated. There are 2 main pathogen complexes, *Pythium* species and *Rhizoctonia* species. These cause Black Root Rot.

Many growers have been asking about plant dips to kill pathogens or to protect plants just prior to field setting. Several products are registered for such uses but only a limited amount of research has been done.

**Abound**—Mix 5-8 fl. oz/100 gal of water. Dip plants for 2-5 minutes. Transplant treated plants as quickly as possible. This treatment has been developed for bare root transplants with a known problem of anthracnose. The dip is a whole plant dip, and some growers do not re-use the water for fear of spreading bacterial angular leaf spot and other diseases. It is reasonable to expect Abound to have some *Rhizoctonia* activity, but there are no research results to demonstrate a benefit. For this purpose, a root dip should suffice, rather than dipping whole plants. *Rhizoctonia* (and the black root rot problem) builds up over time, and it is doubtful that a root dip would offer much benefit in early plant growth. Growers must ensure root dip waste is properly disposed of.

**Switch** – Labeled for suppression of root and crown rot caused by *Colletotrichum* sp. Apply as a pre-plant dip to strawberry roots and crowns at the rate of planting water 5 to 8 oz. per 100 gallons of water rot caused by anthracnose. Wash transplants to remove excess soil prior to dipping. This helps to remove adhering spores from the external plant parts. Completely immerse planting stock in dip solution. Dip or expose plants for a minimum of 2 to 5 minutes. DO NOT reuse solution. Dispose of dip solution according to local regulations. Plant treated plants as quickly as possible. Switch should offer activity against *Rhizoctonia*, *Botrytis*, *Fusarium* and some strains of *Colletotrichum* (anthracnose pathogens).

**Phosphites**—Dip plants in 2.5 lb/100 gal (Aliette), 2 pints/100 gal (ProPhyt), or 2.5 pints/100 gal (Phostrol) for 15 to 30 minutes, and plant within 24 hours after treatment. This treatment should help to suppress *Pythium* and *Phytophthora* problems.

**Rovral**—Dip the plants in a solution of 2 pints/100 gallons for 1-5 minutes and plant immediately. This is primarily for botrytis crown rot and will not improve root health. This treatment is not likely to offer a lot of benefit.

Products like **Oxidate** are registered for plant dip use. However, little data are available, and it is doubtful that they would offer management of root diseases. In most cases, root pathogens are internal to the tissue and these products are primarily surface disinfectants.

#### **POST-PLANTING OPTIONS:**

Ridomil Gold could be applied soon after planting at 1 pint/treated acre through the drip system. Ridomil Gold should offer protection against *Pythium* and *Phytophthora* problems.

Nemacur – Nemacur is a restricted use pesticide and should be handled with extra care. Nemacur 3 Emulsifiable Systemic could be used through the drip system to manage nematodes. Use 5.9 to 8.8 fl. oz/1000 ft of row. This should only be considered in fields with a history of nematode problems. In our experience, nematodes have not been a serious problem on land with a history of strawberry production.

**SUMMARY:** No fumigation can result in decreased yields. However, the main pathogen problems in North Carolina are “root nibblers” and do not kill plants. On average, non-fumigated plots in eastern North Carolina yield 75% of fumigate plots and in Western North Carolina benefits from fumigants have not been observed in our trials. Weed pressure will be greater in non-fumigated land. Growers have several options concerning plants dips. We have done limited research on such dips as well as post-plant sprays without observing benefits. Thus, in general, pre-plant dips are not recommended. Likewise, pretreatment of plug plants is likely to have very limited beneficial effects. Ridomil Gold applied after planting may have the most benefit and should be considered, especially on land with a history of *Phytophthora* crown rot. Manage fields to prevent standing water and saturated soils by channeling excess surface water to headlands and waterways.

#### **PLEASE NOTE:**

Recommendations of specific chemicals are based upon information on the manufacturer's label and performance in a limited number of trials. Because environmental conditions and methods of application by growers may vary widely, performance of the chemical will not always conform to the safety and pest control standards indicated by experimental data.

Recommendations for the use of chemicals are included in this publication as a convenience to the reader. The use of brand names and any mention or listing of commercial products or services in this publication does not imply endorsement by the North Carolina Cooperative Extension Service nor discrimination against similar products or services not mentioned. Individuals who use chemicals are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Be sure to obtain current information about usage and examine current product label before applying any chemical. For assistance, contact your county North Carolina Cooperative Extension Service agent.