

Floating Covers in Commercial Vegetable Production

Cool temperatures in the spring play a significant role in the uncertainty of vegetable production in Nova Scotia. Cool spring weather and the possibility of late spring frost may shorten growing periods for many vegetable crops.

Plant protection by floating covers can prevent losses from late spring frosts and provide a means to favorably modify the environment around the plant. This can result in more rapid growth, possibly increased yields and earlier maturity, which can often translate into a price premium.

Floating covers are flexible, transparent or semitransparent materials porous enough to allow sunlight, water and some air through for ventilation. They are made from polyethylene, approximately 0.75 to 1.1 millimetres in thickness, and are available in various widths on rolls of various lengths.

Floating covers are used to enclose single or multiple rows of plants with the objective of enhancing crop growth and yield by increasing soil and air temperature and reducing wind damage. In periods of temporary frost, they still provide an effective degree of frost protection. Heavy wire or PVC pipes can be used to support row covers, but their light weight allows them to be used with no supporting structure.

Very little research has been done on pesticide use with installed floating covers. In general, insect and disease control has not been a problem because the covers are removed about the time spraying commences. Weed control, however, has been a problem when the covers are used without black polyethylene ground mulch. The covers not only enhance crop development, but also promote weed growth and development. If possible, preplant or preemergent herbicide should be applied prior to employing the floating covers.

While floating covers will limit the access of some pests, the best insect protection when using floating covers (e.g. a virtually insect-free crop) will come when the edges remain securely buried. If bees are required for pollination, floating covers must be removed.

Research in recent years has shown that floating covers alone produce positive yield responses. However, in order to utilize their full potential, they have to be used as a part of an integrated approach which should include black polyethylene ground mulch and drip irrigation to ensure that adequate moisture is present under covers to support the accelerated growth of plants. In our conditions, this system is recommended to be used in pepper, tomato, eggplant, and melon production.

Management practices such as time of application and time of removal have not been adequately researched to date and many times growers have to rely on their own experience. Generally speaking, crops can be covered for three-to-five weeks in spring-planted, cool-weather crops such as lettuce, leeks, broccoli, cauliflower, cabbage. The

heat-loving crops such as tomato, pepper, eggplant, and melons may appreciate longer periods of warmth.

Research at Washington State University (Mt. Vernon Experiment Station) and Oregon State University (Corvallis) have tried a number of crops under row covers in the Northwest. Here are some of the results:

Cabbage, Celery, Cauliflower, Endive, Kohlrabi, Leek: Significantly enhanced earliness (1-3 weeks) for all crops. Excellent protection from insect pests.

Lettuce: Significantly increased yields up to 60%. Increasing covering time has shown to increase yields.

Melons: Significantly enhanced earlier yields (5-28 days) with peak harvest 7 days early.

Onions: Significantly increased total yields, up to 42%.

Peas: Significantly increased total yields, up to 47%.

Peppers: Experienced varying results with most significant being earliness (7-10 days).

Squash: Enhanced earliness and excellent pest protection.

Sweet Corn: Enhanced crop earliness with significant increase in total yields (30-60%).

Tomatoes: Experienced varying results from negative effects on yields to increased (45-60%) early yields and total yields (10-20%).
(Helbacka, J 2002)

Caution has to be exercised in interpreting this data. Limited data exists on yield response to floating covers in Atlantic Canada. Many growers have experienced benefits of this technology in higher yield and earlier maturity and it can be expected that adoption of this system will accelerate in future years.

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