are Sul-Po-Mag or Epsom salts. Sul-Po-Mag is the better choice if potassium is also required, as it is less expensive than Epsom salts. However, Epsom salts can be applied as a foliar spray to alleviate Mg deficiency. Dissolve 1.5 lb per 10 gal water and spray at weekly intervals.

Phosphorus is low in many New England soils, and can limit crop growth, especially early in the season. Soils testing less than 10 lb/acre available phosphate (P_2O_5) usually require substantial applications of phosphate. Hard rock phosphate contains about 2% available P_2O_5, soft, or colloidal, rock phosphate contains 3% available P_2O_5. Thus, a ton of these materials provides only 40 to 60 lb available P_2O_5/acre. Bone meal contains about 20 times more available P_2O_5 by weight, but is more expensive. With soils low in P, it can help crops to place proportionally more P fertilizer in the crop row than to broadcast it evenly. Maintain a pH of 6 to 7 with limestone to maximize P_2O_5 availability. Compost and manures tend to contain P_2O_5 than N or K_2O, but repeated applications will raise P levels substantially.

Potash is very slowly available from granite dust or greensand, which are applied at 3 to 5 tons to the acre to build up K reserves. Wood ashes contain soluble K, but must be used with caution because they will raise the pH rather rapidly and can be caustic. The liming effect of 1 pound of ashes is roughly equal to 2/3 of a pound of limestone. No more than 1/2 ton of ashes per acre should probably be applied at once, and only then if called for by low pH, low K and sufficient Mg. Sul-Po-Mag is the K fertilizer of choice when Mg is also needed.

Minor elements are generally sufficiently supplied to plants by regular additions of organic matter to the soil. Some seaweed extracts may also supply trace minerals. In soils low in boron (B), remedial applications are widely recommended for crops that readily suffer from B deficiency, such as crucifers. In this case, 1 to 2 lb/acre of B is applied to the soil with other fertilizers. Several forms of B are organically permitted, including Solubor (20% B) and Borax (11% B). It is advisable to monitor B levels with soil tests and tissue tests (for perennial fruits). Excess levels of B are toxic to plants, and some crops are quite sensitive to boron.

Organic Certification

Some small fruit growers choose organic production methods. Consumers of organic produce represent a growing market niche. This market is increasingly looking for certification to substantiate product claims. Federal legislation will soon require certification of food products that are labeled as organic except for producers who gross under $5,000.

It is likely that many state groups currently administering organic certification programs will continue to do so with USDA approval in the future. In New England, NOFA (Natural Organic Farmers Association) and MOFGA (Maine Organic Farmers and Gardeners Association) have certification programs; in some cases, these programs are operated in conjunction with the cooperation of a state agriculture department. If you are considering organic production, you should obtain and examine the written standards that detail the allowable practices and materials. These are available from your state certification contact, listed below.

CT	Pat Beardsley, P.O. Box 11, Gaylordsville, CT 06755 (203) 929-3080
MA	Ed McGlew, 140 Chestnut St., W. Hatfield, MA 01088 (413) 247-9264
ME	MOFGA, P.O. Box 2176, Augusta, ME 04338 (207) 622-3118
NH	Vickie Smith, NHDAMF, P.O. Box 2042, Concord, NH 03302-2042 (603) 271-3685
RI	Dan Lawton, Div. of Ag., 22 Hayes St., Providence RI 02908 (401) 222-2771
VT	NOFA, P.O. Box 697, Bridge St., Richmond, VT 05477 (802) 434-4122

About Pest Management

Effective fruit crop production depends on the grower developing a system of crop management that is appropriate for each farm. Decisions need to be made for how to manage all of the normal cultural practices such as planting, fertility, harvesting, and pruning as well as managing the insect, disease, and weed problems that occur either regularly or sporadically. The information in this guide will address management issues related to both common, expected pest problems as well as the occasional appearance of minor pest problems.

Effective management of a pest problem depends on:

- correct diagnosis of the problem and correct identification of the pest causing it.

- use of techniques to prevent or delay infestations or infections as well as techniques to control them.
- early detection of pests by frequent inspection of plants.
- tolerance of pests at population densities that do not cause economic damage.

Diagnostics

Correct diagnosis of a problem and correct identification of the pest (insect, disease, biotic factor, nutrition, etc.) causing it are key to successful crop management and profitability. Below is a list of laboratories that offer disease diagnostics on a fee-for-service basis. See page 108 for a sample submission form that can be used for any of the labs listed below. In general, virus screening is a procedure that is done outside of this region and is referred out by one of the clinics listed below. Contact your local clinic or lab for more information on virus screening.

In order to submit a sample for diagnosis, some basic preparation instructions should be followed. These include:

1. Collect specimens that show a range of symptoms (i.e., from healthy to seriously affected), usually collected from the margin of the affected area. Avoid specimens that are completely dead or decayed as they are not diagnostically useful.
2. Fill out case-history or sample submission form like the one at the end of this guide. This is very important. Without the information included in the form, a correct diagnosis is very difficult.
3. Pack specimen in dry paper and place in a plastic bag (never pack with wet paper towels).
4. Mail specimen and case-history form same-day or overnight delivery, or deliver specimen personally the same day. If this is not possible, place in a refrigerator and mail or deliver the following day. Specimens should come to the diagnostic labs early in the week to avoid problems with weekend hold-overs.
5. Soil samples for nematode analysis.

PLANT DIAGNOSTIC CLINICS OF NEW ENGLAND

(D=plant disease identification, I=insect identification, N=nematode analysis, W=weed identification)

CONNECTICUT

The Plant Disease Information Office (D,I,N)
The Connecticut Agricultural Experiment Station
123 Huntington Street, P.O. Box 1106
New Haven, CT 06504
www.caes.state.ct.us/Plantoffice/plantoffice.htm
(203)974-8601
Cost: call to inquire

MAINE

Insect Pest and Disease Diagnostic Lab (D,I)
Pest Management Office
491 College Avenue
Orono, ME 04473-1295

pmo.umext.maine.edu/ipddl/ipddl.htm
1-800-287-0279 (within Maine)
(207)581-3880
Cost: call to inquire

MASSACHUSETTS

Nematode Assay and Disease Diagnostic Laboratory (D,N)
Dept. of Microbiology/UMass
Fernald Hall, Rm 109
Amherst, MA 01003

www.umassvegetable.org/grower_services/diagnostics_lab.html
(413)545-1045
Cost $25

NEW HAMPSHIRE

The Plant Diagnostic Lab (D,I,W)
Plant Biology Dept.
241 Spaulding Hall/UNH
Durham, NH 03824
(603)862-3200
http://ceinfo.unh.edu/agriculture/documents/agplhlth.htm
Cost: $12

RHODE ISLAND

University of Rhode Island Cooperative Extension Education Center (D,I)
3 East Alumni Avenue
Kingston, RI 02881

www.uri.edu/ce/ceec/plantclinic.html
(401)874-2900
Cost: $10

VERMONT

University of Vermont Plant Diagnostic Clinic (D,I,W)
Attn: Ann Hazelrigg
235 Hills Building
University of Vermont
Burlington, VT 05405
(802)656-0493
http://pss.uvm.edu/pd/pdc/services.htm
Cost: $15