



# HORT MATTERS

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## New Year's Resolutions for Managing Weeds

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It's that time when some of us resolve to do things better in the New Year. Here are some suggestions that may help to improve weed management:

1. I hereby resolve to **learn more about which weeds** are causing problems. Scouting for weeds is an important part of pest scouting, but weeds often get missed when looking for insects and diseases. Plan to assign the extra time in April, May and June when weeds are emerging to take a separate trip through the field looking for only weed seedlings. A weekly weed walk may be needed during this critical period, and in some cases twice a week. Note if weeds emerged before or with the crop, as these weeds are the most competitive ones.
2. I hereby resolve to **learn more about how to identify weeds**. For many of us, this may mean investing in a hand lens to help see the small identifying features of weeds. For seedling broadleaf weeds, you need to be able to see the cotyledon, or the first leaves that emerge, which are often a different shape than the mature leaves. You need to be able to see if they are in an opposite or alternate arrangement on the stalk. For weeds in the Smartweed family, like Lady's-thumb and buckwheat, you need to be able to see the ocrea, which is a sheath of tissue where the leaf connects to the stalk. For grasses, you need to be able to see the auricle, which wraps from the leaf blade slightly around the stem. You also need to see if there is a ligule, which is the fringe of tissue on the leaf blade where it folds away from the stem. Once you've learned these four terms – cotyledon, ocrea, auricle and ligule, you've already kept your resolution!
3. I hereby resolve to **keep better records** about my weed problems. Winter is the time to make field maps, which is the easiest way to track weeds. Although we know there will be weeds in every field, we don't know which species and in which part of the field they will be located. If a map is handy when you are out scouting, you can draw circles showing the weed patches, and jot down which species and how dense they are.
4. I hereby resolve to be **more proactive with new weed problems**. Buying some equipment like a hand sprayer or a wick wiper is a good investment. Plan to charge the wick wiper with glyphosate in the spring, and keep it ready when you find new weed patches. Put together a collection kit in a small cooler for plants that you don't recognize. We receive our best specimens when the roots have been loosened with a hand trowel, then the entire plant is placed first in a paper bag, then inside a larger plastic bag, and kept in a cooler with an ice pack. Add a pen or magic marker to note date and place and you're ready for the season.
5. I hereby resolve to **use a stale seedbed** to reduce my weed pressure. For crops that are planted in late May or early June, the stale seedbed technique can drastically reduce the annual weeds in your crops. Plan to start early as soon as the land is fit. A stale seedbed is set up with either a killed cover crop, or with early tillage to encourage a flush of weeds. A burndown by either herbicide or flaming is done immediately before planting. The key is to plant directly without disturbing the soil, which gives your crop a head start on any late emerging weeds.

6. I hereby resolve to get the **newest edition of Publication 75, Guide to Weed Control**. The 2008 edition is now available from your local OMAFRA offices, or by calling this toll-free number 1-888-466-2372, or from our website [ontario.ca/crops](http://ontario.ca/crops). Look for the updated version on our website soon as well. This is a good investment for only \$15 + GST (which is now only 5%).

If you follow these 6 suggestions, you are already well on your way to a more successful weed management program in 2007. There are many variables that we can't control like rain, temperature and wind conditions, so if we prepare for those we can, we're starting the New Year off in the right direction.



# Soil Moisture Monitoring Tools: A Comparison

Anne Verhallen, Soil Management Specialist

| Soil moisture measurement tools  | Ease of use                     | Reliability | Range of soil types                    | Ease of automation                                  | Portability  | Observations  | Cost   |
|--|---------------------------------|-------------|--|---|--|---|--|
| <b>Feel method</b><br><br>- measures soil water depletion  | iii                             | i           | all                                    | NA  | High   | Requires experience.<br>Open to misinterpretation.  | Operator time  |
| <b>Soil samples</b><br><br>(gravimetric)<br>- measures water content by mass                                 | iii                             | ii          | all                                    | NA  | High   | Time consuming and slow- lots of weighing, waiting and calculating. Highly variable depending on sampling technique, temperature of drying etc.   | Operator time – labour cost high; materials cost low   |
| <b>Tensiometers</b><br><br>- measures soil water tension   | ii                              | ii          | Most except clays.                     | Easy.<br>Requires specialized unit and connections. | Low in season  | Indicates when irrigation is needed, not how much. Proper installation is critical for operation. Placement is important to avoid damage from field operations. High maintenance and regular checking of units needed. Soil type dependent ie most suited for sandy soils as tension can be too high in clay soils. In coarse sand, may require a special unit. | \$100 + per unit<br>Usually 2 units are installed at two different depths and the units stay in one site in the field for the season |
| <b>Electrical resistance blocks</b><br>(eg. Water-marks, gypsum blocks etc)<br>- measures soil water tension | iii                             | ii          | Most except clays.                     | Easy.<br>Requires datalogger and connections.       | Buried for crop season but moveable from season to season.       | Installation generally easy but depends on soil type. Requires some calibration with soil type. Sensitive to salt levels. Low maintenance. Low impact on field operations with appropriate placement. Not very sensitive at high soil moisture. Lifespan ~3 years +. Readings are affected by soil temperature (1% per degree F).                               | Meter \$300 + and individual units \$ 40-50<br>Similar to tensiometers – often 2 units at different depths                           |
| <b>TDR or FDR – Time or Frequency Domain Reflectometry</b><br>- measures volumetric soil water               | i<br>depends upon unit used     | iii         | All, but clays may pose some problems. | Easy but cost prohibitive.                          | High. May require installation of an access tube in the soil.    | Cost in the past has restricted use to researchers and large scale irrigators<br>Depending on unit may need calibration<br>Insertion under dry conditions may be difficult<br>FDR – sample volume 10 inches dia.<br>Around probe  | Cost has come down in recent years - \$600 to 1000+  |
| <b>C-Probe</b>   | ii<br>- once probe is installed | iii         | all                                    | Easy.<br>Requires specialized unit and connections  | Can be moved but normally installed in one place for the season. | Installation generally easy but depends on soil type.<br>Low maintenance.<br>Gives graphical image of soil profile in near-real time.<br>Web based access.<br>Multiple sensor depths.   | Sensor cost \$1200 with data management extra.   |
| <b>Neutron Probe</b><br>- measures moisture content  | i                               | iii         | all                                    | Unit usually too expensive.                         | High.<br>Requires installation of an access tube in the soil.    | Suited to research<br>Uses a radioactive source of neutrons<br>Requires calibration   | High cost in \$1000's.   |

# Soil Moisture Monitoring Equipment Suppliers

Anne Verhallen, Soil Management Specialist

Local suppliers like irrigation and agricultural supply dealers often offer only one or two lines of equipment. If you have difficulty in finding a specific tool, try the list below:

| Supplier  | Address  | Phone/Fax/E-mail/Web  | Equipment Offered  |
|---|--|---|--|
| <b>Campbell Scientific (Canada) Corp</b>  | 11564 - 149 Street NW<br>Edmonton, AB T5M 1W7  | Ph: (780) 454-2505<br>Fx: (780) 454-2655<br><a href="mailto:dataloggers@campbellsci.ca">dataloggers@campbellsci.ca</a>  | Watermark and variety of gypsum block<br>Variety of TDR formats – permanent of seasonal installation   |
| <b>Spectrum Technologies Inc.</b>   | 23839 W. Andrew Road<br>Plainfield, Illinois 60544   | Ph: 1-800-248-8873<br><a href="http://www.specmeters.com">www.specmeters.com</a>  | Watermark sensors; Watchdog loggers and irrigation stations; TDR – portable meters<br>ECHO soil moisture sensors; Irrrometer tensiometers; Soil probes |
| <b>Hortau</b>   | 735, de l'Église<br>St-Romuald, QC G6W 5M6   | Ph: (418) 839-2852<br>or 1-888-5-HORTAU<br>Fx: (418) 839-2851<br><a href="mailto:info@hortau.com">info@hortau.com</a><br><a href="http://www.hortau.com/">http://www.hortau.com/</a>          | Wireless tensiometers  |
| <b>Weather Innovations Incorporated (WIN)</b>   | 7159 Queen's Line<br>R.R. 5 Chatham, ON N7M 5J5  | Ph: (519) 352-5334<br>Fx: (519) 352-7630<br><a href="http://www.weatherinnovations.com">www.weatherinnovations.com</a>  | Provides weather and growing condition monitoring equipment including C Probe and Echo probes  |
| <b>Eijkelkamp</b><br>Note: this is a supplier of very high quality <u>research</u> tools. | Agrisearch Equipment<br>P.O. Box 4<br>6987 ZG Giesbeek<br>Nijverheidsstraat 30,<br>The Netherlands | Ph: 31 313 880200<br><a href="http://www.eijkelkamp.com">www.eijkelkamp.com</a>   | Variety of TDR units<br>Gypsum blocks and Watermarks   |
| <b>E.S.I. Environmental Sensors Inc.</b>  | 100 - 4243 Glanford Avenue<br>Victoria, BC V8Z 4B9   | Ph: (250) 479-6588<br>or 1-800-799-6324<br>Fx: (250) 479-1412<br><a href="mailto:info@esica.com">info@esica.com</a><br><a href="http://www.esica.com">www.esica.com</a>                       | Moisture point and Gro-point TDR   |
| <b>Gemplers</b>   | Corporate Sales<br>P.O. Box 44993<br>Madison, WI 53744-4993  | Ph: 1-800-382-8473<br>or (608) 662-3301<br>Fx: (608) 662-3360<br><a href="mailto:corpsales@gemplers.com">corpsales@gemplers.com</a><br><a href="http://www.gemplers.com">www.gemplers.com</a> | Watermark sensors<br>Irrrometer tensiometers   |
| <b>Ben Meadows Company</b>  | PO Box 5277<br>Janesville WI 53547-5277  | Ph: 1-800-241-6401<br>Fx: 1-800-628-2068<br><a href="http://www.benmeadows.com/">www.benmeadows.com/</a>  | Watermarks and other gypsum blocks   |
| <b>Soil Moisture Equipment Corp.</b>  | 801 S. Kellogg Ave.<br>Goleta, CA 93117  | Ph: (805) 964-3525<br>Fx: (805) 683-2189<br><a href="http://www.soilmoisture.com/index.html">www.soilmoisture.com/<br/>index.html</a>   | Tensiometers<br>Variety of TDR type equipment  |

### Minor Use Label Expansion Granted For Frontier Herbicide For Control Of Weeds On Transplanted Cabbage

### Minor Use Label Expansion Granted For Poast Ultra Herbicide For Control Of Weeds On Peanuts In Ontario

The Pest Management Regulatory Agency (PMRA) recently announced the approval of a minor use label expansion for **FRONTIER** herbicide (dimethenamid) for control of labeled weeds on transplanted cabbage in Canada. Frontier herbicide was already labeled for use on corn, soybeans, dry beans, dry onions and grapes in Canada. This is the 1<sup>st</sup> label expansion for Frontier herbicide to a Brassica vegetable.

This minor use submission was sponsored by Agriculture and Agri-Food Canada, Pest Management Centre (AAFC-PMC) in 2003 in response to minor use priorities identified by Canadian Brassica crop producers and extension personnel. The 2003 project was originally for the entire crop group, Brassica vegetables, however at this time only transplanted cabbage has been granted a registration.

Access to new weed management tools has been a priority for cabbage producers and the registration of Frontier herbicide will provide cabbage producers with an effective and useful pre-transplant weed management tool.

Frontier herbicide can be applied as a single pre-transplant treatment at a rate of 1.1 – 1.4 L product per ha in a water volume that ensures thorough coverage as per the current label directions. The pre-harvest interval for transplanted cabbage is 60 days.

Frontier herbicide should be used in an integrated weed management program and in rotation with other management strategies. Follow all other precautions and directions for use on the Frontier herbicide label.

This minor use submission was sponsored by AAFC-PMC as a result of priorities established in consultation with producers. We also wish to thank the personnel of **BASF Canada Inc.** for their support of this registration and the personnel of the Pest Management Regulatory Agency for evaluating and approving this important pest management tool.

For copies of the new minor use label contact Leslie Huffman, OMAFRA, Harrow (519) 738-1256, Jim Chaput, OMAFRA, Guelph (519) 826-3539 or visit <http://www.agsolutions.ca>

The Pest Management Regulatory Agency (PMRA) recently announced the approval of a minor use label expansion for **POAST ULTRA** herbicide (sethoxydim) for control of labeled weeds on peanuts in Ontario. Poast Ultra herbicide was already labeled for use on a wide range of Canadian specialty and minor crops. This is the first minor use label expansion for peanuts in Canada in over 15 years.

This minor use submission was sponsored by minor use office of OMAFRA in the fall of 2006 in response to minor use priorities identified by Ontario peanut producers and extension personnel.

Weed management has been a high priority for peanut producers and the registration of Poast Ultra herbicide will provide peanut producers with an effective and useful weed management tool.

Poast Ultra herbicide can be applied at a rate of 0.34 L product per ha in one post emergent application in a water volume that ensures thorough coverage as per the current label directions. Poast Ultra herbicide should be applied at the 1-6 leaf stage of annual grasses and the 1-4 leaf stage of wild oats and volunteer cereals. The pre-harvest interval for peanuts is 40 days.

Poast Ultra herbicide should be used in an integrated weed management program and in rotation with other management strategies. Follow all other precautions and directions for use on the Poast Ultra herbicide label.

This minor use submission was sponsored by the provincial minor use office of OMAFRA as a result of priorities established in consultation with producers. We also wish to thank the personnel of **BASF Canada Inc.** for their support of this registration and the personnel of the Pest Management Regulatory Agency for evaluating and approving this important pest management tool.

For copies of the new minor use label contact Leslie Huffman, OMAFRA, Harrow (519) 738-1256, Jim Chaput, OMAFRA, Guelph (519) 826-3539 or visit <http://www.agsolutions.ca>

# Managing Problem Deer Populations

Kathryn Carter, Pome Fruit IPM Specialist and John Gardner, Apple Specialist

As the snow starts to fall, deer start congregating in wintering grounds and actively seek high energy sources of food for survival. Dormant apple trees with both healthy fruit buds and new shoot growth provide an excellent food source during the winter months. Anyone who drives or lives in southern Ontario is aware that deer sightings have increased. In the US, the national deer population is estimated to be 25 million to 30 million. Deer have become well adapted to living in environments near suburbia, they have benefited from warmer winters, and by a decline in hunting in some areas. Deer prefer fragmented habitat that consists of both woodland for cover and open crop land. The USDA estimates that total deer damage from auto collisions and crop and timber losses reaches at least \$1 billion a year (Mullen, 2002).

Deer damage to young non-bearing and mature apple trees can be troublesome. Smaller more compact apple trees in higher density plantings make a greater proportion of the tree canopy available for browsing by deer. Feeding on soft tender shoot tips and terminal growth as well as fruit buds in winter and early spring often results in an acute reduction in bearing surface, and changes in tree shape. Smaller trees can be damaged or destroyed by rubbing of antlers to remove velvet, in a process called 'horning'. This type of injury is usually seen in orchards from September to mid-November. Controlling deer damage in orchards can work where an integrated approach is used, which includes regulated hunting (with authorization), scare devices, repellents and fencing (conventional and electric). For a given deer density, the potential for damage is often greater on large plantings than on small ones, as a result, large areas often require more substantial fencing designs to achieve a level of protection similar to small areas. Nursery trees in large blocks can require exclusion fencing to ensure recovery of quality nursery stock if there are large herds in proximity to these young trees.

## Fencing

There are several different types of fences available including woven wire fence which is an excellent option for areas where deer densities are high and the likelihood of damage is great. The permanent woven wire fence provides a barrier that requires little maintenance but can be expensive to install. The costs of these fences often limit their use around orchards, with the exception of nurseries. The 2.4 m (8 foot) high, vertical fence is constructed from two (1.2 m) (4 foot) sections of 15-30 cm (6 x 12 inch) wire mesh, joined with hog rings. Two or more strands of barbed wire spaced 25 cm (10 inches) apart are added to the top of the structure extending the overall height to 3 m (10 ft) or more. Based on research in New York, blocks larger than 20 ha (50 acres) usually require this fencing to reliably prevent deer from entering the area if feeding pressure is high.

## Invisible fencing

Another type of fence is mesh fencing. This fence is considered to be strong, long lasting, virtually invisible and easy to install. The fence is made of a series of 10 cm (4") square UV resistant polyethylene mesh. Each strand has a breaking strength of 80 kg (175 pounds). The mesh is stretched 6 m (20 ft) between existing trees, or poles that can be used to support it. The entire area that needs

to be protected must be enclosed in order for the fencing to be effective. This fencing is considered to be very effective because deer have poor vision and depth perception. The barrier and accessories are black so the deer can't judge where the fence starts or stops. They are scared of the fence and will run around it's perimeter but will not generally challenge it vertically. This fence provides a humane and discreet barrier that keeps deer out of sensitive areas without relying on chemicals or electricity.

## High-tensile electric fence

This fencing has emerged as the preferred method to exclude deer from orchards in New England. These fences are easy to erect, repair and maintain. In addition, the high voltage low impedance chargers can electrify long fence lines up to 1.5 km (5000 feet) or more). Temporary electrified fences are simple, inexpensive and useful. Baiting the fence with peanut butter, apples etc. may enhance the effectiveness of electrified fences. Deer are attracted to these fences by appearance or smell and are lured into contacting the fence with their noses. The shock trains the deer to avoid the fenced area. Permanent high tensile electric fences provide year round protection from deer and are best suited to orchard crops. In New York they consider these designs to be best used under light deer pressure, or for relatively small areas. Low profile fences seldom provide satisfactory protection of commercial orchards in the winter especially if snow restricts deer from using alternative food sources. Landowners must check local ordinances to determine if electric fences can be used on their property.

## Scare devices

Frightening deer using scare devices may be effective and economical in some situations, particularly when their first become a problem in the orchard. However once deer establish a pattern of movement it is difficult to get them to change. Propane cannons, cap exploders, strobe light, sirens, fire works and gunfire can be used as a temporary method of scaring off deer. However deer often become accustomed to them within a week or two even when the devices are moved occasionally. Scare devices are usually a short term solution. Some growers even use dogs to help scare deer. Dogs are kept behind an 'invisible fence' using a radio transmitter, an underground copper wire and a special dog collar with receivers. Dogs are placed inside the fence, and the dogs chase the deer out of their territory. If they attempted to pass the invisible fence they receive a mild harmless shock. Be aware that a family pet may not provide adequate protection because it is not patrolling all the time. Often large aggressive dogs work best.

## Repellents

There are two types of repellents that can be used for deer contact and area repellents. Contact repellents are applied to the plants and repel by taste. Area repellents are those used most commonly in orchards and are applied near the plants to be protected and repel deer by smell alone. Some area repellents include suspending bars of hand soap to the trees, or hanging bags of human hair from the tree. Some growers have reported that the use of Surround Crop Protectant containing kaolin clay acts as a deterrent to deer feeding while getting trees established. Unfortunately these repellents may only be a temporary solution to the problem.

## **Hunting**

During the hunting season, problem deer in orchards can be hunted by licensed hunters. Agricultural deer removal authorization is another way of managing deer populations. Applications can be obtained from the Ministry of Natural Resources (MNR) to hunt outside of the normal sport hunting season. These permits can be used to harass and/or remove deer that are causing significant agricultural damage, when other reasonable methods to prevent damage are ineffective. Only those animals that are damaging crops can be removed. Orchardists may apply for an agricultural deer removal permit through their local MNR district office. Applicants are normally required to document and describe all other non-destructive attempts to control a damaging population of deer. Applicants must meet certain criteria and a site visit is usually completed. Authorizations are closely controlled and complement local deer management objectives. Deer removal authorizations can not be used to provide recreational out of season hunting opportunities or personal gain.

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