

For April 2008 VegEdge (Pea Section)

## **Be Prepared for Weed Management in Your Pea Crop in 2008**

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Weed management is an important component of pea production. Weeds in pea fields reduce yields and interfere with harvest. Buds of Canada thistle or corn chamomile (“daisy”) can contaminate harvested peas because they are similar in size and color. Nightshade berries can also be a problem in late harvested peas. Injury to pea fields may occur if herbicide applications are not timed properly. Approximately 20,000 acres of processing green peas are grown in NY each year for canning and freezing. This article is geared towards the processing industry, but fresh market growers may also garner some useful information.

Peas do not compete well with weeds and it is wise to avoid fields with known serious weed problems. Growers should also note that peas are sensitive to residues of several herbicides. Peas are very sensitive to atrazine. Do not plant in fields where more than one pound of atrazine was applied the previous year. There is an 18 month restriction for planting into fields where mesotrione (Callisto, Camix, Lexar, Lumax) and clopyralid (Hornet, Stinger) have been applied. Make sure to know the history of herbicide use in your field and note planting restrictions for peas.

Redroot pigweed (*Amaranthus retroflexus*), common lambsquarters (*Chenopodium album*) and common ragweed (*Ambrosia artemisiifolia*) are annual broadleaf weeds commonly found in pea fields in NY. They are particularly troublesome because they grow taller than the peas and compete for light, water and nutrients. These weeds can significantly reduce pea yields. Seeds of common lambsquarters and common ragweed tend to germinate earlier in the spring than redroot pigweed. The peak emergence of these two species generally occurs by mid-June, however, some seedlings will continue to emerge throughout the growing season. Annual grasses are also very competitive with peas. In NY we are particularly concerned with large crabgrass (*Digitaria sanguinalis*), barnyard grass (*Echinochloa crus-galli*), and foxtails (*Setaria* spp.)

Corn chamomile (*Anthesis arvensis*), also known by pea growers as daisy, is a winter or summer annual which often grows in clumps. It is of special concern to pea growers because the flower buds and seed heads can become contaminants at pea harvest. Reproduction is by seed which germinates in late summer, early autumn, or early spring. Research by Dr. Bellinder’s group at Cornell has shown that the fall cohorts cause the most problem because they bloom at the time the pea crop is in the field. Limiting the production of seed is very important to keeping this weed from spreading. None of the herbicides registered on peas will control this species. However, one option is to apply Harmony Extra with TotalSol 50 SG as a fallow application in the fall to infested fields. Use 0.45 to 0.9 oz product per acre and include a non-ionic surfactant. There is a 45 day rotation restriction before planting peas. Wheat and barley growers should note that Harmony Extra and Buctril will control this weed when applied to young, actively growing corn chamomile seedlings in the fall.

Canada thistle (*Cirsium arvense*) is of special concern to pea growers because the flower buds can be a contaminant in the harvested crop. Canada thistle is a perennial broadleaf weed that often grows in patches. Thistrol and Basagran will inhibit bud formation, but neither will provide long-term control of Canada thistle because of its perennial root system that commonly extends to depths of 3 ft or more. The only way to really control this weed is to exhaust the storage roots. Begin first removal of shoots in late spring. Continue to remove shoots before they attain several leaves. After 2 years of shoot removal the weed will be killed.

Nightshade berries are another potential contaminant in peas. Furthermore, nightshade is attractive to Colorado potato beetles, which also feed on and contaminate peas. Hairy nightshade (*Solanum sarrachoides*) and eastern black nightshade (*Solanum ptycanthum*) are the two common species in NY. They are annual broadleaf weeds. Being able to distinguish between the two species is important in their control. In the seedling stage, leaves of black nightshade are purple on the underside. As its name implies, foliage of hairy nightshade contains many small “hairs”, especially as the plant grows past the seedling stage. Readers are encouraged to consult weed identification references for this and other weed species. Nightshade berries may not have time to form in early planted and early maturing pea fields and thus are more of a concern in later harvested fields.

The narrow row spacing in peas makes cultivation generally impractical. Rotary hoes and tine weeders are effective on germinating weeds, but may also pull stones onto the soil surface. Small stones become a contaminant problem in harvested peas, and larger stones directly interfere with harvesting equipment.

Herbicides labeled for use in peas include pre-plant incorporated, pre-emergence, and post-emergence products (see Table). Herbicide choice should be based on the weed species, crop growth stage, weather, and pre-harvest interval. A relative comparison of products labeled in NY in 2008 is given in the table. Applicators should read the product labels carefully for full details. Sencor is missing from the table because it is no longer labeled for peas in NY. New for 2008 is a registration for the pre-emergence application of Dual Magnum.

Post-emergence herbicides need to be applied at the correct stage of pea growth to avoid crop injury. Most products refer to the number of nodes in a pea plant. A node is a point on a stem where a leaf is or has been attached. When a pea seed germinates, the cotyledons remain below the soil surface (Figure 1). The shoot grows upward. The first two nodes have incomplete or stipular leaves. Beginning with the third node, the pea plant has a compound leaf comprised of two fleshy stipules at the base, a petiole (leaf stalk) with two or three pairs of leaflets, and usually several tendrils at the end. When counting nodes, it is very important to remember that one or several nodes may be below the soil surface depending on how deep the seed was planted. Thistrol and Raptor herbicides cannot be applied within a certain number of nodes to flowering. Early varieties can flower as soon as 9 nodes. You can find out the number of nodes to flowering for a certain variety by contacting your seed company in person or by visiting the websites below:

Brotherton Seed Company, Inc.  
<http://www.brothertonseed.com/index.html>

Seminis Vegetable Seeds

<http://us.seminis.com/>

<http://us.seminis.com/pc/downloadDocument.do?id=8779> (processing pea brochure)

Syngenta-Rogers Brand

<http://www.rogersadvantage.com/products/processor.asp>

Pure Line Seeds, Inc.

<http://www.purelineseed.com/>

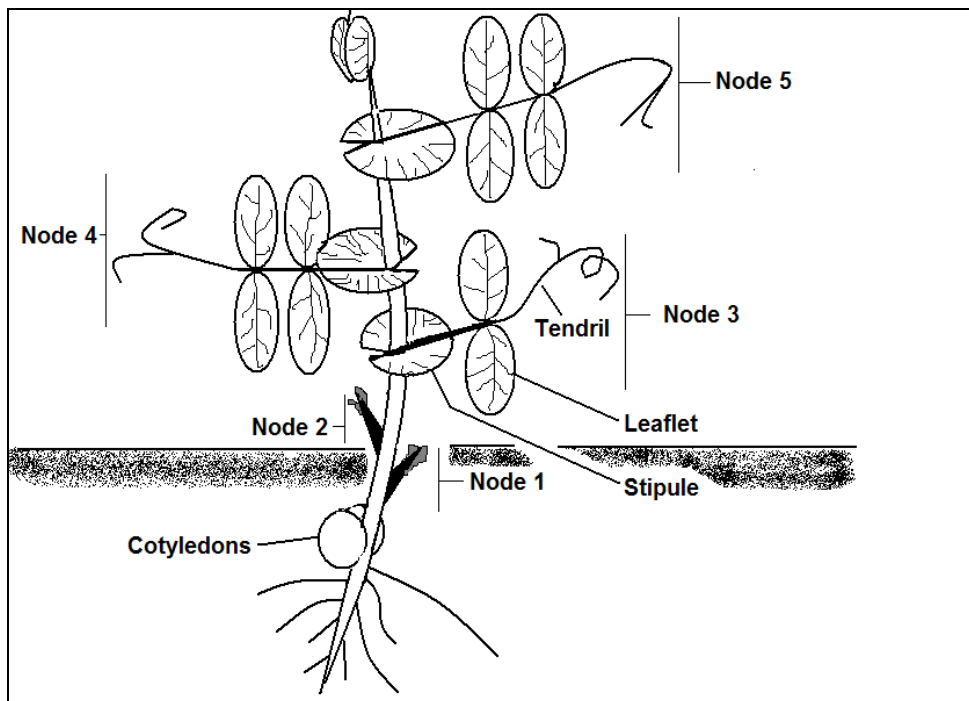


Figure 1. Morphology of a typical young pea plant. Note that nodes 1 and 2 have only small undeveloped leaves and may be above or below the soil surface depending on how deep the seed was planted. True leaves begin to develop at node 3. Afilea (leafless) peas (not shown) have stipules and tendrils, but no leaflets. Drawing by Julie Kikkert, Cornell.

In summary, the best weed management strategy in peas begins with selection of fields without serious weed problems. Herbicides are needed in nearly all processing pea fields. Know which weed species you are trying to control and the best herbicide and management strategy for those species. Remember to time your herbicide applications properly to the growth stage of the peas and the weeds. In hot weather, peas can put on nodes rapidly so check the field again if herbicide applications must be delayed due to weather or time constraints. If you don't have weeds present, then there is no need to apply post-emergence herbicides. Lastly, there are temperature restrictions for some herbicides to obtain the best activity and least crop injury. Always read the product labels for details.

## Relative Effectiveness of Herbicides Available for Use in Peas in New York for 2008<sup>1</sup>

(compiled by Julie Kikkert, Cornell Vegetable Program and Robin Bellinder, Cornell)

Key <sup>2</sup> E=Excellent G=Good F=Fair P=Poor to None	BROADLEAF ANNUALS										ANNUAL GRASSES				PERENNIALS		
	Lambsquarters	Purslane	Common Ragweed	Pigweed	Smartweed	Galinsoga	Mustard	Nightshade	Velvetleaf	Chamomile ("daisy")	Barnyardgrass	Crabgrass	Fall Panicum	Foxtail sp.	Quackgrass	Yellow Nutsedge	Canadian Thistle
<b>Pre-Plant Incorporated</b>																	
Treflan HFP (trifluralin)	F	F	P	P	P	P	P	P	P	P	E	E	G	E	P	P	P
Prowl (pendimethalin)	G	G	P	G	F	P	F	P	G	P	E	E	E	E	P	P	P
<b>Pre-Emergence</b>																	
Command 3ME (clomazone)	F	F	F	P	F	F	P	P	G	P	G	G	G	G	P	P	P
Dual Magnum (s-metolachlor)	G	G	P	E	P	E	P	G <sup>6</sup>	P	P	E	E	E	E	P	E	P
<b>Post-Emergence</b>																	
Basagran <sup>3</sup> (bentazon)	G	F	G	F	G	P	G	G <sup>7</sup>	G	F	P	P	P	P	P	P	P
Thistrol 2S <sup>4</sup> (4-MCPB)	G	P	P	G	G	P	P	P	P	P	P	P	P	P	P	P	F
Raptor <sup>5</sup> (imazamox)	F	F	P	E	F	F	E	E	P	P	P	P	P	F	P	P	P
Poast (sethoxydim)	P	P	P	P	P	P	P	P	P	P	G	F	G	G	F	P	P
Assure II/Targa (quizalofop P-ethyl)	P	P	P	P	P	P	P	P	P	P	E	E	E	E	E	P	P
<b>PPI, Pre- or Post-Emergence</b>																	
Pursuit (imazethapyr)	G <sup>8</sup>	P	P	E	P	P	E	E	P	P	P	P	P	P	P	P	P

<sup>1</sup>For information only. Always read NYS approved product labels carefully before use.

<sup>2</sup>General comparison. Effectiveness may vary with method of application, rate, use of an adjuvant, size of weed, and soil and climatic factors. See label for specific information.

<sup>3</sup>Peas must have 3 nodes with true leaves before application.

<sup>4</sup>Do not apply later than 3 nodes before flowering.

<sup>5</sup>Apply to peas at least 3 inches tall, but prior to 5 nodes before flowering. Basagran must be used with all Raptor applications.

<sup>6</sup>Eastern Black nightshade only.

<sup>7</sup>Hairy nightshade only.

<sup>8</sup>Only the pre-plant incorporated application is effective.