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EXTENSION AND ADVISORY TEAM

GUIDE TO PEST MANAGEMENT IN LEEKS

Nova Scotia Vegetable Crop Guide to Pest Management 2020
[LEEK1-20]

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Updated April 23, 2020 by
Peter Burgess, Horticulturist, Perennia
Mélanie Leclerc, Research Associate, Perennia

IMPORTANT

This publication was compiled by representatives from Perennia using information from the Pest Management Regulatory Agency of Health Canada, specific pesticide labels, previous Atlantic Provinces Vegetable Pest Guides and manufacturer's information. **This information is continuously changing and therefore it can cease to be current and accurate. Pesticide labels are the best source of information and should always be consulted prior to using a product.** The label is the best source of information on: registered crop uses, rates, days to harvest, compatibility with other pesticides, toxicity and other special information on its effective and safe use

By printing this publication, Perennia does not offer any warranty or guarantee, nor do they assume any liability for any crop loss, animal loss, health, safety or environmental hazard caused by the use of a pesticide mentioned in this publication.

WARNINGS

This publication is meant to be used as a reference for possible pest control options. Where there are multiple brand names of a specific active ingredient registered in Canada, Perennia has only listed a couple for reference purposes and as such does not endorse one brand over another. If you have purchased a generic product not specifically in this guide but has your crop and pest on the label, always follow that product label.

If any information in this or any other publication conflicts with the information on the label, always use the label recommendation. If you have an old label, your pesticide supplier should be able to give you the newest label. You are legally responsible for the safe use of pesticides you purchase. This means the safe transport and storage of these materials, the label rates used on crops, and the safe disposal of containers.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
WEEDS:							
Preplant *Perennial weeds including quackgrass*	9	glyphosate	**Roundup WeatherMAX**	1.67-8.0 L/ha	12 hours	-	Apply in the fall or spring prior to planting. Annual weed control programs will be necessary to control weeds germinating after planting. For quackgrass control, apply to actively growing quackgrass when at least 4 new leaves are present. The low rate (2.5 L/ha) will provide a minimum of one season control, while higher rates (4.75 to 7 L/ha) will provide longer term control. The low rate of Roundup should be applied in 50 to 100 L/ha water. If higher water volumes are used add a suitable surfactant. Wait 72 hours before plowing under. Best control of quackgrass is obtained when these herbicides are applied in the fall.
			Touchdown 480	2.5-7.0 L/ha	12 hours	-	
	14	carfentrazone-ethyl	**Aim EC**	36.5-117 mL/ha	12 hours	1	Apply in minimum spray volume of 100 L/ha. Refer to label for target weeds, buffer zones and rates. Use high flow rate nozzles to apply the highest spray volume.
Pre-emergence *Stale Seedbed Technique*	22	paraquat	**Gramoxone 200 SL**	2.75-5.5 L/ha	24 hours	-	Apply in 300 – 1100L of water/ha to foliage of emerged weeds but before the crop has emerged.
		diquat	**Reglone 240, Dessicash**	2.3-4.6 L/ha	24 hours	-	
Postemergence *Inter-row*	22	paraquat	**Gramoxone 200 SL**	2.75-5.5 L/ha	24 hours	-	Do not spray solution on the crop plant since it could be injured or killed. Use gramoxone for best control of grasses.

shielded		diquat	**Reglone 240, Dessicash**	2.3-4.6 L/ha	24 hours	-	
	14	carfentrazone-ethyl	**Aim EC**	36.5-117 mL/ha	12 hours	1	Apply in minimum spray volume of 100 L/ha. Refer to label for target weeds, buffer zones and rates. Use high flow rate nozzles to apply the highest spray volume.
Grass and broadleaf	5	prometryn	**Gesagard 480 SC**	3.75 L/ha	12 hours	-	2 applications 10 days apart before weeds are 5 cm high. Make applications to well established transplanted leeks that have one fully expanded leaf.
Post-transplant, before weed emergence	3	Pendimethalin	**Prowl H_2O**	2.2-3.3 L/ha 6.6 L/ha	4 days scouting 7 days hand-set irrigation 15 days hand weeding	30	Broadleaf & annual grass. Mineral soils: 2.2-3.3 L/ha. Muck soils: 6.6 L/ha 1 application per season.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted-Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
INSECTS:							
Thrips	1B	malathion	**Malathion 85E**	1100-1345 mL/ha	12 hours	3	Apply using enough spray mixture to ensure thorough coverage.
	3	cyhalothrin-lambda	**Matador 120 EC or Labamba**	188 ml/ha	24 hours	14	Max 3 applications/yr. Allow 7 days between treatments. Apply in 500 L of water /ha.
	5	spinetoram	**Delegate WG**	200-336 g/ha	12 hours	3	Recommended water volume of 300-500 L water/ha with sufficient pressure to ensure spray solution penetrates leaf axils. Apply when thrips first appear targeting eggs at hatch and small nymphs. Use higher applications when insect pressure is high or insects are at advanced stage of growth. Maximum 3 applications per year with 7-10 days between treatments. Do not apply 2 consecutive applications of group 5 insecticides. Rotate to another class of insecticide for at least one application.
	5	Spinosad	**Success 480SC**	218-262 ml/ha	When dry	3	**Suppression only.** Target small nymphs and eggs at hatching. Allow 7-10 days between applications. Maximum of 3 applications per year. Apply in 300-500 L/ha.
			Entrust 80W	131-158 g/ha			
			Entrust SC	437-527 ml/ha			
	23	Spirotetramat	**Movento 240 SC**	365 mL/ha	12 hours	7	Apply when thrips are first noticed. Movento should be used during the first half of the season when adult populations are relatively low or building. Reductions in numbers of thrips larvae may take 3 to 4 days after Movento is applied.

	28	Cyantraniliprole	**Exirel**	1000-1500 ml/ha	12 hours	1	**Suppression only.** Begin applications when populations are low. Thorough coverage is essential for optimum control. For optimum control, apply Hasten NT Spray Adjuvant* at an application rate of 0.25% v/v or MSO Concentrate with Leci-Tech* at an application rate of 0.5% v/v. If thrips populations are high, use a registered insecticide with a different mode of action to reduce populations before applying Exirel. Make no more than 4 applications per season. Do not apply more than once every 5 days.
	6	Abamectin	**Agri-Mek 1.9% EC**	0.6-1.2 L/ha	12 hours (13 days hand weeding 4 days hand-set irrigation 1 day thinning & scouting)	7	Foliar application only. Allow 7 days between applications. Apply when pest populations are building but before damage occurs. Consult local extension specialists, professional consultants or other qualified authorities to determine appropriate threshold levels in your area. Use the higher application rate under heavy pest pressure.
Leek Moth	3	cyhalothrin-lambda	**Matador 120 EC or Labamba**	188 ml/ha	24 hours	14	Max 3 applications/yr. Allow 7 days between treatments. Apply in 500 L of water /ha.
	5	spinetoram	**Delegate WG**	200-336 g/ha	12 hours	3	Recommended water volume of 300-500 L water/ha with sufficient pressure to ensure spray solution penetrates leaf axils. Apply when thrips first appear targeting eggs at hatch and small nymphs. Use higher applications when insect pressure is high or insects are at advanced stage of growth. Maximum 3 applications per year with 7-10 days between treatments. Do not apply 2 consecutive applications of group 5 insecticides. Rotate to another class of insecticide for at least one application. Do

							not apply within 3 days of harvest.
	5	Spinosad	**Success 480 SC**	218-262 ml/ha	When dry	3	Apply in high water volume to ensure spray solution penetrates into leaf axils. Reapply at 7-10 day intervals. Do not apply more than 2 sequential applications. Max 3 applications per year. Target eggs at hatch or small larvae.
			Entrust 80 W	131-158 g/ha			
			Entrust SC	437-527 ml/ha			
	11	*Bacillus thuringiensis*, subsp. *aizawai, (*Strain ABTS-1857 fermentation solids, spores, and insecticidal toxins)	**XenTari WG**	500-1000 g/ha	4 hours	0	**Suppression only**. Apply sufficient spray volume to ensure uniform deposition on all plant surfaces; recommend 1000 L per ha.
	28	Chlorantraniliprole	**Coragen**	250-375 mL/ha	12 hours	1	**Suppression only.** Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
DISEASES:							
Purple Blotch	7	boscalid	**Cantus WDG**	0.475 kg/ha	12 hours	7	Max 6 applications/yr. Do not apply more than 2 sprays in succession before alternating to another fungicide family.
	11	pyraclostrobin	**Cabrio**	0.56-0.84 kg/ha	12 hours	7	Max 3 applications/yr. Do not apply more than 2 sprays in succession before alternating to another fungicide family. Use on a 10-14 day schedule.
	7-11	boscalid/pyraclostrobin	**Pristine WG**	1.0-1.3 kg/ha	3 days (thinning), when dry (general)	7	Max 6 applications/yr. Apply at 7-14 day intervals. Do not make sequential applications when downy mildew occurs. (Suppression only).
	7	penthiopyrad	**Fontelis**	1.25-1.75 L/ha	12 hours	3	Begin applications prior to disease development, continue on a 7-10 day interval. Use higher rate and shorter interval when disease pressure is high. Max seasonal rate is 5.25 L/ha. Make no more than 2 sequential applications before switching to another mode of action.
	9-12	Cyprodinil and Fludioxinil	**Switch 62.5 WG**	775-975 g/ha	12 hours 3 days (hand weeding)	7	**Suppression only.** Begin when conditions are favorable for disease but before infection. Maximum of 3 applications/yr. Apply at 7-14 day intervals.
	7-9	Fluopyram & pyrimethanil	**Luna Tranquility**	1200 ml/ha	12 hours	7	Begin fungicide applications preventatively.

							Continue as needed, on a 7- to 12-day interval.
	7	Benzovindiflupyr	**Aprovia**	750 ml/ha	12 hours	7	Begin applications when the plants are 5-10 centimeters high or when conditions become favourable for disease development. Make applications on a 7 – 14 days interval. Use the shorter interval when conditions are more conducive to disease. **Also controls garlic rust (*Puccinia allii*).**
	11, 3	Azoxystrobin, difenoconazole	**Quadris Top**	710-1000 mL/ha	12 hours	7	Apply as a broadcast foliar spray in sufficient water for thorough coverage. A minimum spray volume of 150 L/ha is recommended. Apply on a 7 to 14 day interval, starting prior to disease onset when conditions are conducive to disease. If disease pressure is high, use the highest rate and shortest interval.
Downy Mildew	11	fenamidone	**Reason 500 SC**	400 ml/ha	When dry	7	**Suppression Only.** Begin application as soon as conditions become favourable for disease development. Apply in 300-600 L/ha on a 5-10 day interval. Max 4 applications per year. Plant back interval of 30 days. Make no more than 2 sequential applications of Reason 500 SC or other Group 11 fungicide before alternating with a fungicide from a different Group.
	11	pyraclostrobin	**Cabrio**	0.56-0.84 kg/ha	12 hours	7	**Suppression only.** Max 3 applications/yr. Do not apply more than 2 sprays in succession before alternating to another fungicide

							family. Use on a 10-14 day schedule.
	7-11	boscalid/pyraclostrobin	**Pristine WG**	1.0-1.3 kg/ha	When dry, 3 days (thinning)	7	**Suppression only.** Max 6 applications/yr. Apply at 7-14 day intervals. Do not make sequential applications when downy mildew occurs.
	44	*Bacillus subtilis*	**Serenade *Opti***	1.7-3.3 Kg/ha	-	0	**Biopesticide that will only suppress the indicated diseases.** Begin applications at the first sign of disease, or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
	40	Dimethomorph	**Acrobat 50 WP**	450 g/ha	2 days (hand harvesting – thinning) 12 hours (no entry)	0	**Acrobat 50 WP must be applied as a tank mix with another fungicide active against downy mildew**. Begin applications when conditions favour disease development. Continue on a 5-7 day schedule as needed until weather conditions favouring infection and sporulation decrease. DO NOT use less than 200 L of water/ha for ground applications. Max 5 applications per year.
	40,45	Ametoctradin, dimethomorph	**Zampro**	1.0 L/ha	Hand harvesting – 1 day All other activities – 12 hours	0	To reduce the risk of the development of fungicide resistance use in rotation with other fungicides having a different mode of action active against downy mildew. Begin applications prior to disease development and continue on a 5-7-day interval. Max 3 applications.

	M1	Copper	**Cueva**	0.5% to 2% solution, applied at 470-940 L/ha solution	4 hours	1	Re-apply using 5-10 day intervals.
	33	Mono- and dibasic sodium, potassium, and ammonium phosphites	**Phostrol**	2.9-4.3 L/ha	12 hours	0	For preventative suppression of downy mildew begin foliar applications when conditions favouring disease development exist and continue on a 7-14 day interval. Do not apply more than 7 applications per year.
	U15	Oxathiapiprolin	**Zorvec Enicade**	0.0875-0.35 L/ha	12 hours	0	Begin applications prior to disease development and continue on a 5 to 10 day interval. Use higher rate and shorter interval when disease pressure is high.
Botrytis leaf blight & Botrytis Neck Rot	7	boscalid	**Cantus WDG**	0.475 kg/ha	12 hours	7	Max 6 applications/yr. Do not apply more than 2 sprays in succession before alternating to another fungicide family.
	7-11	boscalid/pyraclostrobin	**Pristine WG**	1.0-1.3 kg/ha	When dry, 3 days (thinning)	7	Max 6 applications/yr. Apply at 7-14 day intervals. Do not make sequential applications for downy mildew (suppression only).
	44	*Bacillus subtilis*	**Serenade *Opti***	1.7-2.5 Kg/ha	-	0	**Biopesticide that will only suppress the indicated diseases.** Begin applications at the first sign of disease, or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.

	9-12	Cyprodinil and Fludioxinil	**Switch 62.5 WG**	775-975 g/ha	12 hours 3 days (hand weeding)	7	Maximum of 3 applications/yr. Begin when conditions are favorable for disease but before infection. Apply at 7-14 day intervals, no more than 2 sequential applications.
	M1	Copper	**Cueva**	0.5% to 2% solution, applied at 470-940 L/ha	4 hours	1	Re-apply using 5-10 day intervals.
	7-9	Fluopyram & pyrimethanil	**Luna Tranquility**	1200 ml/ha	12 hours	7	Begin fungicide applications preventatively. Continue as needed, on a 7 to 12-day interval. Apply maximum of 2 applications per season for Botrytis.

Use the following web link to search for any pesticide label mentioned in this guide, or any other pesticide registered in Canada:

http://pr-rp.hc-sc.gc.ca/ls-re/index-eng.php

PESTICIDE EMERGENCY CONTACT INFORMATION

Poison Control Centres		
Nova Scotia	800.565.8161 **or** 902.428.8161	IWK, Halifax, NS
New Brunswick	911	Ask for Poison Information
Prince Edward Island	800.565.8161 **or** 902.428.8161	IWK, Halifax, NS
Newfoundland	709.722.1110	Dr. Charles A. Janeway Child Health Care Centre, St. John's, NF

Environmental Emergencies (Pesticide Spills)	
Transport Canada Regional Operations Centre (24 hours)	
Nova Scotia	800.565.1633
New Brunswick	800.565.1633
Prince Edward Island	800.565.1633
Newfoundland	800.563.9089

ABBREVIATIONS & CONVERSIONS

Formulation and Measurement Abbreviations			
FORMULATIONS		MEASUREMENTS	
EC, E	Oil-based emulsifiable concentrate	mL	millilitre
EG	Water dispersible granule	kPa	kilopascal
WG	Wettable granule	kg	kilogram
WDG	Wettable dry granule	g	gram
SC	Suspension concentrate	L	litre
Sn	Solution	BIU	Billions of International Units
		ppm	parts per million (1000 ppb)
		ppb	parts per billion (1/1000 ppm)

Helpful Conversions[1]	
kPa X 0.14 = pounds per square inch (psi)	millilitres X 0.035 = fluid ounces
hectares X 2.47 = acres	litres X 35 = fluid ounces
kilograms X 2.2 = pounds	litres X 0.22 = imperial gallons
kilograms per hectare X 0.89 = pounds per acre	litres per hectare X 14.17 = fluid ounces per acre
kilograms per hectare X 0.40 = kilograms per acre	litres per hectare X 0.40 = litres per acre
	degree-days C X 1.8 = degree-days F

[1] **Pesticide Units of Measurement**
It is not recommended to convert label rates to imperial units because there is a high probability of mathematical and rounding errors. Present day pesticides are formulated to be more effective in smaller amounts. Therefore, even small conversion errors can lead to the use of incorrect rates (either too high or too low). Use metric – you will be glad you did!