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# ROYAL MH<sup>®</sup> 60 SG

**A plant growth regulator containing maleic hydrazide to control sprouting and shrinkage in storage (potatoes and onions) and to provide grass, tree, and shrub growth control.**

SOLUBLE GRANULES

## COMMERCIAL

**ACTIVE INGREDIENT: Maleic hydrazide 60%**  
**(present as potassium salt)**

**Warning, contains the allergen sulfites**

**REGISTRATION NO. 18143**  
**PEST CONTROL PRODUCTS ACT**

**READ THE LABEL AND ENCLOSED BROCHURE BEFORE USING**

UPL AgroSolutions Canada Inc.

PO Box 12219

Research Triangle Park, NC 27709 For Product Use Information Call 1-800-438-6071

**NET CONTENTS 11.3 kg**

FOR CHEMICAL EMERGENCY: spill, leak, fire, exposure, or accident call CHEMTREC 1-800-424-9300.

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## **INTRODUCTION:**

ROYAL MH 60SG is a plant growth regulator. When applied to healthy growing plants the active ingredient, maleic hydrazide, is absorbed by the plant and will affect plant growth by stopping cell division, but not cell expansion. Through such action, ROYAL MH 60SG effectively controls sprout development in potatoes and onions under proper conditions and will limit the growth of grasses, trees and shrubs, when applied according to label directions.

The effect of ROYAL MH 60SG is, however, temporary and the length of growth control obtained will be a function of the rate applied, the accuracy of application and crop conditions before, during and following time of application.

Optimal results can only be obtained when ROYAL MH 60SG is applied to healthy plants which are free from damage from insects or disease and other forms of stress. These other forms of stress might include items such as weeds, extremes (either high or low) of temperature, moisture, light intensity, or soil fertility either during the growing season and/or at the time of application.

Applications of ROYAL MH 60SG to plants experiencing any such stress conditions may lead to a lack of efficacy and/or accentuate the symptoms of these conditions in the plant. All users are reminded of the necessity of reading the complete label carefully before using ROYAL MH 60SG and of taking particular note of the sections entitled CAUTIONS and USE RESTRICTIONS.

If this pest control product is to be used on a commodity that may be exported to the U.S. and you require information on acceptable residue levels in the U.S., visit CropLife Canada's website at [www.croplife.ca](http://www.croplife.ca).

## **DIRECTIONS FOR USE:**

### **MIXING INSTRUCTIONS:**

1. Be sure sprayer is clean and not contaminated with any material.
2. Fill tank 3/4 full with clean water and start agitation.
3. Pour ROYAL MH 60SG slowly from bag into tank. Avoid dumping all contents at once.
4. Allow 2-3 minutes agitation for dissolving.
5. Add registered tank-mix if required.
6. Complete filling tank.
7. NOTE: ROYAL MH 60SG already contains a surfactant. The addition of further wetting agents or commercial spray adjuvants is not recommended.

### **USE PRECAUTIONS:**

- KEEP OUT OF REACH OF CHILDREN.
- May cause eye irritation.
- **DO NOT** enter or allow worker entry into treated areas for 12 hours following application.
- Field sprayer application: **DO NOT** apply during periods of dead calm. Avoid application

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of this product when winds are gusty. **DO NOT** apply with spray droplets smaller than

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the American Society of Agricultural Engineers (ASAE) medium classification. Boom height must be 60 cm or less above the crop or ground.

- Airblast application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** direct spray above plants to be treated. Turn off outward pointing nozzles at row ends and outer rows. **DO NOT** apply when wind speed is greater than 16 km/hr at the application site as measured outside of the treatment area on the upward side.

- Aerial application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply when wind speed is greater than 16 km/hr at flying height at the site of application. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification. To reduce drift caused by turbulent wingtip vortices, the nozzle distribution along the spray boom length **MUST NOT** exceed 65% of the wing- or rotorspan.

**PERSONAL PROTECTIVE EQUIPMENT:**

- Wear a long-sleeved shirt, long pants, and shoes plus socks during mixing, loading, application, cleanup and repair, for all methods of application. In addition, wear chemical-resistant gloves during mixing/loading and when applying by hand-held equipment.
- Wear a dust mask during mixing/loading activities.

**BUFFER ZONES:**

Use of the following spray methods or equipment **DO NOT** require a buffer zone: Hand-held or backpack sprayer and spot treatment.

The buffer zones specified in the table below are required between the point of direct application and the closest downwind edge of sensitive terrestrial habitats (such as grasslands, forested areas, shelter belts, woodlots, hedgerows, riparian areas and shrublands).

Method of Application	Crop	Buffer Zones (metres) Required for the Protection of Terrestrial Habitats	
Field Sprayer	Potato, onion (sprout inhibition) Tree/shrub, non-crop grass (growth control)	1	
Airblast	Tree/shrub (early season)	10	
Aerial	Onion	Fixed or rotary wing	15
	Potato	Fixed or rotary wing	20

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For tank mixes, consult the labels of the tank-mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture and apply using the coarsest spray (ASAE) category indicated on the labels for those tank mix partners.

### **POTATOES**

ROYAL MH 60SG is a valuable component of a comprehensive potato program which has, as its main objective, the production and maintenance of quality potatoes both in the field and during the storage period.

**SPROUT CONTROL:** A single field treatment of ROYAL MH 60SG will control sprout development in storage by prolonging the naturally-occurring dormant state of the potato.

ROYAL MH 60SG will control sprout development in all potato varieties, however the length of control obtained in a given season will be a function of several factors including variety, growing conditions, application accuracy, length of storage period and conditions during the storage period. ROYAL MH 60SG will not make a poor-keeping potato into a good-keeping potato. For example, varieties that break dormancy rapidly (such as Norchip) will sprout sooner than varieties such as Russet Burbank, which characteristically hold for a longer period of time. While ROYAL MH 60SG can be effectively used on Norchips, growers should not expect this variety to hold as well as treated Russet Burbanks. Potato storages need to be continuously monitored and corrective action taken when tubers begin to sprout.

**ADDITIONAL BENEFITS:** In addition to sprout control, ROYAL MH 60SG can help reduce storage losses and improve potato quality through a number of additional effects on the potato. Both the extent and number of these benefits obtained will depend on several factors such as variety and local growing conditions. These additional benefits will not always be achieved. A grower should concentrate on obtaining good sprout control with ROYAL MH 60SG, accepting these others as add -on bonuses when they are realized.

**MAY IMPROVE GRADE:** Royal MH 60SG may improve grade by reducing roughness of potatoes, especially Russet Burbanks, if application is made prior to any secondary tuber formation.

### **REDUCES NUMBER OF UNDERSIZED POTATOES:**

Timely applications of ROYAL MH 60SG can substantially reduce the number of undersize potatoes left in the field at harvest, by helping eliminate late season 'sets' of potatoes.

**REDUCTION OF VOLUNTEER POTATOES:** ROYAL MH 60SG application can reduce the number of volunteer potatoes the following spring by reducing the number of late season sets left in the field.

**REDUCES SHRINKAGE:** With ROYAL MH 60SG inside the tuber, potatoes do not respond as readily to external stimuli. As a result, potato respiration rates do not accelerate as quickly in storage, hence shrinkage can be reduced by up to 15 percent.

**RATE:** Apply ROYAL MH 60SG at a rate of 5.65 kg, in a minimum of 300 litres of water, per hectare by ground equipment or a minimum of 100 litres, per hectare by aerial equipment. One 11.3 kg package will treat 2 hectares.

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**TIMING:** Apply ROYAL MH 60SG to potatoes within the period between two - three weeks past full bloom and two weeks before expected date of topkill or first frost. When precisely the application is made, within this period, will be a management decision the grower must make based largely on tuber size and intended use for the crop.

Apply no later than 10 days before topkill. Use only one application per year.

Once ROYAL MH 60SG is translocated down to the potato tuber, further growth will be limited. Therefore, the majority of tubers must be at least 3.8 - 5 cm (Russett varieties should be 3.8 – 5 cm and round white varieties should be 3.8 cm) in diameter if they are to reach a minimum size of 110-170 grams at harvest.

Under conditions where secondary tuber sets are common, the grower may choose to delay application until these smaller tubers have also sized. Care must be exercised that application is not delayed too long so that the interval between ROYAL MH 60SG application and the use of a vine killer, occurrence of frost or early vine death is less than 2 weeks.

#### **POTATO PRECAUTIONS:**

1. Do not apply ROYAL MH 60SG to potatoes to be used for seed purposes.
2. Uneven or excessive application may result in reduced efficacy and physical disorders such as bud end cracking and/or elephant hide on potatoes tubers.
3. The use of ROYAL MH 60SG on potatoes must be combined with management practices, both in the field and in storage, conducive to the production of quality potatoes. Less than optimal conditions, either in the field or during storage, may overcome the effect of ROYAL MH 60SG and cause sprouting to occur earlier than desired.
4. Do not apply ROYAL MH 60SG after the upper leaves have turned from dark green to a light green or yellow colour as insufficient material will be absorbed and translocated from the leaves to the tubers - thus giving unsatisfactory sprout control.
5. Do not apply too early. Applications made prior to proper sizing of tubers can reduce yields and result in plant injury.
6. See 'USE RESTRICTIONS' for further precautions.

#### **ONIONS**

The use of ROYAL MH 60SG for sprout control in onions should be combined with the selection of management practices both in the field and in storage, conducive to the production of quality onions. Length of control obtained will vary with field and storage conditions. The better these conditions, the better the results obtained. ROYAL MH 60SG will not make poor-keeping varieties equal to good-keeping varieties.

**RATE:** Apply ROYAL MH 60SG at a rate of 3.75 kg in a minimum of 300 litres of water per hectare by ground equipment, or a minimum of 100 litres per hectare by aerial equipment. One 11.3 kg package treats three hectares.

**TIMING:** ROYAL MH 60SG should be applied when the bulbs are fully mature, have at least 5 - 8 green leaves, and have necks soft enough for the tops to fall over if they have not already done so. The spray is often applied when 50 percent of the tops have fallen but all tops are still green. This condition usually occurs about 10 days to two weeks before

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harvest time. Green tops are essential for the absorption of ROYAL MH 60SG.

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Apply no later than 10 days before harvest. Use only one application per year.

**ONION PRECAUTIONS:**

1. Avoid spraying onions too early. Spongy hollow necked bulbs may result if spraying is done earlier than two weeks before maturity.
2. Apply to healthy plants. If tops fall irregularly due to thrips or blight damage, spraying with ROYAL MH 60SG may give unsatisfactory results.
3. Apply to healthy plants. Do not apply to fields badly infested with weeds, insects, or disease as absorption and translocation may not occur, and results will be less than optimal.
4. See 'USE RESTRICTIONS' for further precautions.

**GRASS GROWTH CONTROL:**

ROYAL MH 60SG can be used to reduce mechanical mowing of various turf locations such as hard to mow areas along highways, airport property, industrial areas, golf course roughs and similar areas.

It can be used on all turf areas except:

1. On fine lawns where aesthetic appearance is more important than reducing a maintenance chore, and
2. Those areas under heavy foot traffic (such as golf course fairways and greens) where regrowth is needed to overcome physical injury to the grass.

A treatment of ROYAL MH 60SG will inhibit seed head formation, and will slow down leaf growth. If the application is timed properly, no significant growth will occur for several weeks after treatment. As the effect gradually 'wears off' the turf may grow to 15-30 cm in height by the end of the growing season. One or more mechanical mowings may be required if grass height must be kept under 15 cm.

**TIMING:** One application per year, either in the spring or fall, should be used.

**SPRING:** The two week period in the spring when the grass has first grown 5-10 cm is ideal for applying ROYAL MH 60SG. This is normally the period when dandelion and forsythia are in full bloom. This application will curtail the normal spring flush of growth and eliminate the need to mow for several weeks. If time or weather does not permit early application, and grass is 15 cm or higher, the product should be applied and the area mowed about 7 days later. This procedure helps to prevent 'stretching' of the seed head in the treated area. Under no conditions should grass be mown to a height of less than 7.5 cm. If mowed below this level a scalped appearance of the retarded grass may occur.

**FALL:** ROYAL MH 60SG may also be applied late in the growing season to reduce grass growth the following spring. Treatment should be made while grass is still green but not dormant (usually during October). An additional benefit of the fall treatment is control the following spring of wild onion, garlic and biennial weed such as dandelion and plantain. Since grass growth is inhibited the following spring, the area will 'green-up' about two weeks later than untreated turf.



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**RATE:** Apply 6.5 - 8.0 kg of ROYAL MH 60SG in 400 litres of water per hectare. Use higher rates in fall treatments and in very rough and hard to mow areas in the spring.

**USE OF 2,4-D:** 2,4-D should be used with ROYAL MH 60SG in most spring applications. A low volatile ester or amine salt formulation is compatible with ROYAL MH 60SG. Read 'MIXING INSTRUCTIONS' and follow dosage and precautionary information on the 2,4-D label. For weeds that have not emerged at time of ROYAL MH 60SG application, a separate, later spray of 2,4-D is recommended.

**GRASS PRECAUTIONS:**

1. Apply only to green vigorous grass, free of disease and insect damage.
2. Do not use if turf is wilted, or during periods of extended drought as absorption will be poor and results will be unsatisfactory.
3. Do not apply during the summer months as most permanent grasses become partially dormant during this period.
4. All turf areas to be treated should contain well-established perennial grasses at least three years old.
5. If a healthy clipped appearance is required, the ROYAL MH 60SG application should be supplemented by mowing, as even treated turf will eventually resume growth as the effect of ROYAL MH 60SG gradually 'wears off'.
6. Spraying on relatively calm days (wind velocity under 15 km/h) with equipment that will apply the product uniformly is essential for best results.
7. Turf to be treated must be free of leaf cover, clippings, or other debris which will prevent direct contact of the spray with the grass.
8. Do not treat pastures or pasture livestock in, or cut hay from, treated areas.
9. Do not use on home lawns except along edges.
10. At recommended application rates ROYAL MH 60SG should not normally affect the color of grass. However, under certain conditions of optimal absorption, color modification for a period of several weeks may be encountered. At times, treated grass may appear a greener color than untreated.
11. See 'USE RESTRICTIONS' for further precautions.

**TREE AND SHRUB GROWTH CONTROL:**

ROYAL MH 60SG can be used to suppress excessive vegetative growth and reduce the need to mechanically prune or shear tree and/or shrubs.

**RATE:** Apply 9.25 kg of ROYAL MH 60SG in 1000 litres of water. Spray this concentration to wet all surfaces of leaves and bark to the point of drip (not run-off). Direct spray pattern towards area where growth inhibition is desired. For example, apply to the upper half of the tree if the top terminal growth is to be inhibited and growth will continue in the unsprayed sections.

**TIMING:** ROYAL MH 60SG should be used only once a year either in the spring or early summer. The spring treatment should be applied to green, vigorous, new growth. New leaves should be fully expanded. For a summer application, plants should first be pruned to the desired shape. At least 5-10 cm of regrowth should then occur before treatment is

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applied to hide fresh cut ends of limbs and stems and prevent a barren appearance of the treated plant.

**TREE SPECIES TREATED:**

Sycamore, willow alder, poplar, oak, mulberry, black walnut, maple, sweet gum, elm, and tamarack.

**SHRUB SPECIES TREATED:**

Privet, pyracantha, myrtus, xylosmas, viburnum, eugenia, pittosporium, cissus, Hahns ivy, Algerian ivy, honeysuckle, forsythia and ice plant.

**TREE AND SHRUB PRECAUTIONS:**

1. Do not spray trees or shrubs when wind velocity exceeds 15 km/hour.
2. Tree and shrub growth control is best when ROYAL MH 60SG is applied to vigorous new growth.
3. To be effective it is essential that ROYAL MH 60SG be applied uniformly to the treated area.
4. See 'USE RESTRICTIONS' for further precautions.

**USE RESTRICTIONS**

1. Do not apply to crops being grown for seed.
2. Do not graze the treated crops or cut for hay; sufficient data are not available to support such use.
3. Even though ROYAL MH 60SG is non-volatile, care should be taken during application to prevent drift onto nearby crops. Do not spray when wind velocity exceeds 15 km/hour.
4. Best results are obtained when ROYAL MH 60SG is applied under slow drying conditions, (i.e. during early morning hours or all day on cloudy days.)
5. ROYAL MH 60SG is water-soluble and under high temperatures and low humidity conditions will crystallize on the leaf surface and not be absorbed into the plant. Do not apply if daily temperatures are expected to exceed 30°C.
6. Apply at least 24 hours before or after rain or applying overhead irrigation. Rain or overhead irrigation occurring within 24 hours will reduce effectiveness by affecting absorption into the plant. For optimum uptake, plants should not be under water stress (either too much or too little) before or after application of ROYAL MH 60SG.
7. Equipment must be set up and calibrated to ensure an even uniform spray pattern is delivered to the target crop.

**ENVIRONMENTAL HAZARDS:**

- TOXIC to non-target terrestrial plants. Observe buffer zones specified under DIRECTIONS FOR USE.
- Do not contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.
- To reduce runoff from treated areas into aquatic habitats, consider the characteristics and conditions of the site before treatment. Site characteristics and conditions that may lead to runoff include, but are not limited to: heavy rainfall, moderate to steep slope, bare soil, poorly draining soil (e.g. soils that are compacted or fine textured such as clay).
- Avoid application of this product when heavy rain is forecast.

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- Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

#### **FIRST AID:**

**IF SWALLOWED:** Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an unconscious person.

**IF IN EYES:** Hold eye open and rinse slowly and gently with water for 15–20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.

**IF ON SKIN OR CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15–20 minutes. Call a poison control centre or doctor for treatment advice.

**IF INHALED:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.

Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

#### **STORAGE AND DISPOSAL:**

**STORAGE:** Store product in original container only away from other pesticides, fertilizer, food or feed. Keep container closed.

#### **DISPOSAL:**

1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Follow provincial instruction for any required additional cleaning of the container prior to its disposal.
3. Make the empty container unsuitable for further use.
4. Dispose of the container in accordance with provincial requirements.
5. For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills.

**NOTICE TO USER:** This pest control product is to be used only in accordance with the directions on the label. It is an offense under the Pest Control Products Act to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

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