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# ROYAL MH-30<sup>®</sup> XTRA

**A plant growth regulator containing maleic hydrazide to control sprouting and shrinkage in storage (potatoes and onions), to improve grade and reduce undersized tubers and for sucker control on black tobacco and for sprout control in shallots (dry bulb) and garlic.**

SOLUTION

## COMMERCIAL

**ACTIVE INGREDIENT: Maleic hydrazide (present as potassium salt)..... 270 g/L**

REGISTRATION NO. 29607  
PEST CONTROL PRODUCTS ACT

WARNING – EYE IRRITANT

READ THE LABEL AND ATTACHED BOOKLET BEFORE USING

NET CONTENTS: 10 L - Bulk

UPL AgroSolutions Canada Inc.  
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Research Triangle Park, NC 27709

**FOR CHEMICAL EMERGENCY (Spill, leaks, fire, exposure or accident)CALL  
CHEMTREC: 1-800-424-9300**

**For Product Use Information Call 1-800-438-6071**

## **INTRODUCTION:**

**ROYAL MH-30® XTRA** 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-30 XTRA** effectively controls sprout development in potatoes and onions. When used on potatoes grown under proper growing conditions it will improve grade and reduce the number of undersized tubers.

The effect of **ROYAL MH-30 XTRA** is, however, temporary and the length of growth control obtained will be a function of rate, accuracy of application and crop conditions before, during and following time of application.

Optimal results can only be obtained when **ROYAL MH-30 XTRA** is applied to healthy plants which are free from damage from insects or disease and other forms of stress. These other forms of stress 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-30 XTRA** 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.

Uniform and complete coverage is essential for satisfactory results. Although **ROYAL MH-30 XTRA** is best applied via ground equipment, there may be times when it is necessary to apply through aerial application, for instance, when the potato vines have grown across the rows. **Aerial application may result in reduced performance.**

All users are reminded of the necessity of reading the complete label carefully before using **ROYAL MH-30 XTRA** and of taking particular note of the sections entitled USE PRECAUTIONS and USE RESTRICTIONS.

## **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-30 XTRA** slowly from jug into tank.
4. Allow 2-3 minutes agitation for complete dispersion.
5. Complete filling tank.
6. NOTE: **ROYAL MH-30 XTRA** already contains a surfactant; hence the addition of further wetting agents or commercial spray adjuvants is not recommended.

**USE PRECAUTIONS:**

- KEEP OUT OF REACH OF CHILDREN.
- Causes eye irritation. DO NOT get in eyes.
- **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 of this product when winds are gusty. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification. Boom height must be 60 cm or less above the crop or ground.
- 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, chemical-resistant gloves, socks and shoes during mixing, loading, application, clean-up and repair. In addition, wear protective eyewear (goggles or face shield) during mixing and loading. Gloves are not required during application within a closed cab.

**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 Habitat
Field Sprayer	Potato, onion, shallot (sprout inhibition), black tobacco, garlic	1
Aerial (potatoes only)	Potato	Fixed or rotary wing 20

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 the coarsest spray (ASAE) category indicated in the labels for those tank mix partners.

**POTATOES**

**ROYAL MH-30 XTRA** 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-30 XTRA** will control sprout development in storage by prolonging the naturally-occurring dormant state of the potato.

**ROYAL MH-30 XTRA** 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-30 XTRA** 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-30 XTRA** can be effectively used on Norchips, growers should not expect this variety to hold as well as treated Russet Burbanks.

**ADDITIONAL BENEFITS:** In addition to sprout control, **ROYAL MH-30 XTRA** 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, therefore a grower should concentrate on obtaining good sprout control with **ROYAL MH-30 XTRA**, accepting these others as add -on bonuses when they are realized.

**MAY IMPROVE GRADE:** 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-30 XTRA** 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-30 XTRA** 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-30 XTRA** 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-30 XTRA** at a rate of 12.6 L, in a minimum of 300 litres of water, per hectare by ground equipment or a minimum of 100 litres, per hectare by aerial equipment. **Aerial application may result in reduced performance.**

**TIMING:** Apply **ROYAL MH-30 XTRA** when the smallest tubers that will reach harvestable size are at least 5 cm in diameter. The timing of application may occur within the period between two - three weeks past full bloom and two weeks before expected date of topkill or first frost. Apply no later than 10 days before topkill.

Once **ROYAL MH-30 XTRA** is translocated down to the potato tuber, further growth will be limited. Therefore, the majority of tubers must be at least 5 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-30 XTRA** application and the use of a vine killer or occurrence of frost is less than 2 weeks.

**POTATO PRECAUTIONS:**

1. Do not apply **ROYAL MH-30 XTRA** 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-30 XTRA** 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-30 XTRA** and cause sprouting to occur earlier than desired.
4. Do not apply **ROYAL MH-30 XTRA** 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. Use only one application of **ROYAL MH-30 XTRA** per year.
7. See 'USE RESTRICTIONS' for further precautions.
8. Warning: May cause sunburn in larger tuber varieties such as Shepody.

**ONIONS**

The use of **ROYAL MH-30 XTRA** 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-30 XTRA** will not make poor-keeping varieties equal to good-keeping varieties.

**RATE:** Apply **ROYAL MH-30 XTRA** at a rate of 8.36 L in a minimum of 300 litres of water per hectare by ground equipment only. DO NOT APPLY USING AERIAL APPLICATION EQUIPMENT.

**TIMING:** **ROYAL MH-30 XTRA** 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 harvest time. Green tops are essential for the absorption of **ROYAL MH-30 XTRA**. Apply no later than 10 days before harvest.

**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-30 XTRA** 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. Use only one application of **ROYAL MH-30 XTRA** per year.
5. See 'USE RESTRICTIONS' for further precautions.

### **BLACK TOBACCO**

Top and sucker the plants when 10 to 25% of the plants in the field have one open flower. Remove all existing suckers, and apply **ROYAL MH-30 XTRA** within 24 hour after topping. Apply 9.35 to 12.44 L of **ROYAL MH-30 XTRA** (2.52 to 3.36 kg a.i./ha) in 450 L water per hectare. Apply the higher rate when plants are very vigorous. Best results are obtained when **ROYAL MH-30 XTRA** is applied to the upper 1/3 to 1/2 of the plant. To obtain satisfactory control, it is very important to apply equal amounts of **ROYAL MH-30 XTRA** to each plant, at the correct time.

DO NOT APPLY USING AERIAL APPLICATION EQUIPMENT.

#### **APPLICATION EQUIPMENT:**

**Apply ROYAL MH-30 XTRA on black tobacco only by ground.** Apply with motorized field sprayers (high-clearance or tractor-mounted) equipped with solid cone nozzles that deliver a coarse spray at 20 to 30 psi (98 to 146 kg/sq m) in a uniform spray pattern.

#### **APPLICATION NOTES:**

1. Always follow dosage recommendations carefully and spray field uniformly. Too little **ROYAL MH-30 XTRA** may result in less than desired sucker control; too much may reduce quality of tips.
2. Use only one application of **ROYAL MH-30 XTRA** per year, unless rains occur within 6 hours after application. Should wash-off occur within 6 hours, a single repeat application may be made to ensure effective sucker control.
3. To control tobacco suckers effectively, apply **ROYAL MH-30 XTRA** at the proper time. Spraying too early in the season may prevent normal development of top leaves; spraying too late will allow some sucker growth.
4. Compatibility studies with **ROYAL MH-30 XTRA** and foliar-applied fungicides and insecticides have not been completed. Separate application is recommended.
5. Do not use on tobacco plants grown for seed production.
6. Do not spray tobacco in the middle of hot, dry days when leaves are severely wilted. For best results, spray during the early morning, or all day on cloudy days, avoiding late afternoon or night applications.
7. Closely hand-suckered tobacco or tobacco treated with **ROYAL MH-30 XTRA** will not ripen as rapidly as poorly suckered tobacco. Also, under some conditions **ROYAL MH-30 XTRA** treated tips have a tendency to turn yellow prematurely. This is not harmful and does not mean that your tobacco is ripe. Therefore, do not harvest tobacco treated with **ROYAL MH-30 XTRA** by using time and colour of the leaves as your only guide to ripeness. Use other characteristic indicative of ripeness such as:
  - a. Fading of colour from midrib
  - b. Change in apparent leaf texture.
8. If tobacco plants have been grown under drought conditions, absorption of **ROYAL MH-30 XTRA** may be slow, and results may not be as good as when plants have been grown under normal conditions.

9. Allow at least 7 days after application before harvest.
10. Even though **ROYAL MH-30 XTRA** is non-volatile, no drift should be permitted onto nearby crops.
11. **SURFACE WATER ADVISORY:** Under some conditions, maleic hydrazide may have a significant potential for runoff into surface water (primarily via dissolution in runoff water), for several days post-application. Conditions favouring runoff include poorly draining soils or wet soils with readily visible slopes, frequently flooded areas, areas where an intense or sustained rainfall is forecast to occur within 48 hours, areas overlying extremely shallow ground water, and areas overlying tile drainage systems that flow to surface water.

**USE PRECAUTIONS:**

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

Apply only when meteorological conditions at the treatment site allow for complete and even crop coverage.

Do not apply to any body of water. Avoid drifting of spray onto any body of water or other non-target areas. Specified buffer zones should be observed.

Coarse sprays are less likely to drift, therefore, avoid combinations of pressure and nozzle type that will result in fine particles (mist). Do not apply during periods of dead calm or when wind velocity and direction pose a risk of spray drift. Do not spray when the wind is blowing towards a nearby sensitive crop, garden, terrestrial habitat (such as shelter-belt) or aquatic habitat.

All personnel on the job site must wash hands and face thoroughly before eating and drinking. Protective clothing, aircraft cockpit and vehicle cabs must be decontaminated regularly.

The DIRECTIONS FOR USE for the uses described in this section of the label were developed by persons other than UPL AgroSolutions Canada Inc. under the User Requested Minor Use Label Expansion program. For these uses, UPL AgroSolutions Canada Inc. has not fully assessed performance (efficacy) and/or crop tolerance (phytotoxicity) under all environmental conditions or for all crop varieties when used in accordance with the label. The user should test the product on a small area first, under local conditions and using standard practices, to confirm the product is suitable for widespread application.

**DIRECTION FOR USE: For Sprout Control on Shallots (dry bulb) and Garlic**

Apply 8.36 L of **ROYAL MH-30 XTRA** in a minimum of 300 L of water per hectare as a broadcast foliar spray using ground application equipment. **ROYAL MH-30 XTRA** 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 harvest time. Green tops are essential for the absorption of **ROYAL MH-30 XTRA**. Use only one application per year. DO NOT apply within 10 days of harvest.

DO NOT apply using aerial application equipment.

### 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-30 XTRA** 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-30 XTRA** is applied under slow drying conditions, (i.e. during early morning hours or all day on cloudy days.)
5. **ROYAL MH-30 XTRA** 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-30 XTRA**.
7. Equipment must be set up and calibrated to ensure an even uniform spray pattern is delivered to the target crop.

### ENVIRONMENTAL PRECAUTIONS:

- **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.
- 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.

**TOXICOLOGICAL INFORMATION:** Treat symptomatically.

**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.

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