Fact Sheet

PROTUGAN® Herbicide

A Suspension Concentrate (SC) containing 500 g/litre isoproturon

PROTUGAN controls grass and broadleaf weeds in wheat and winter-sown barley and should be applied at the early post-emergence stage of the weeds.

PROTUGAN contains isoproturon, a phenylurea herbicide from the substituted urea group of herbicides. It is absorbed by both shoots and roots but is translocated only in the xylem. Since it is also soil acting and has low solubility it will give some residual protection against later germinating weeds.

PROTUGAN blocks photosynthesis, the food production process in plants, by destroying cell membranes. Plants are not affected by the herbicide until after they emerge and begin photosynthesis. Injury symptoms from foliar applications will appear as leaf burn as the cell membranes are destroyed. These symptoms generally appear most rapidly with hot humid conditions.

GENERAL INFORMATION:

PROTUGAN may be used on all varieties of wheat at any growth stage up to jointing although it may cause slight crop yellowing under cool wet conditions or on light soils. This is temporary and will not affect subsequent crop growth or yield. Tank mixing is recommended to improve the spectrum of weeds controlled.

DIRECTIONS FOR USE:

<table>
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<tr>
<th>Crop</th>
<th>Use Rate</th>
<th>Critical comments</th>
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<tbody>
<tr>
<td>WHEAT Winter and spring sown</td>
<td>2 – 3 litres/Ha</td>
<td>Apply between early post-emergence and first node. Best control will be achieved with application to weeds at the 1-2 leaf stage.</td>
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<td>BARLEY winter sown only</td>
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<td>Use the higher rate on heavy soils or soils which are high in organic matter.</td>
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PROTUGAN should not be applied:
- to oats, triticale, or durum wheat, rye or other cereals not listed
- to cereals under-sown with grass or clover
- under drought conditions
- if severe frosts are expected
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PROTUGAN should not be applied to cereals undersown with grass or clover; to oats, triticale, or durum wheat, rye or other cereals not listed; under drought conditions; or if severe frosts are expected.

<table>
<thead>
<tr>
<th>Weeds Controlled</th>
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<td>SUSCEPTIBLE</td>
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<td>Annual poa, chamomiles, charlock, chickweed, fathen, groundsel, lesser canary grass, nettle, penny cress, shepherd’s purse, spurrey.</td>
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<tr>
<td>MODERATELY SUSCEPTIBLE</td>
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<tr>
<td>Ryegrasses, wild oats.</td>
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<tr>
<td>NOT CONTROLLED</td>
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<tr>
<td>Cleavers, black nightshade, fumitory, henbit, sow thistles, speedwells.</td>
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PROTUGAN should be applied to actively growing weeds at the 1-2 true leaf stage. Susceptible weeds germinating after application will be controlled by residual activity. If prolonged dry weather follows application made on to a dry soil, the speed of action will be slow and the overall level of weed control reduces, especially in the spring. Overall weed control may be reduced if the seedbed is coarse or if there is excess organic matter. Do not use on soils with an organic matter content over 10%. Do not apply to waterlogged soils or those prone to water-logging after heavy rain, as weed control may be reduced.

To avoid run off, Do NOT use PROTUGAN where soils are cracked or excessively dry.

TANK MIXING & COMPATIBILITY:
Tank mixing with ADAMA CHLORSULFURON is recommended to improve the spectrum of weeds controlled.

CAUTION:
For tank mixtures other than Chlorsulfuron, test on small areas first unless local experience has shown the mixture to be compatible and safe on the crop.

Other suggested tank mixtures include products containing cereal selective sulphonylurea herbicides, IOTRIL®, BROMOTRIL®, mixtures containing bromoxynil, TOMAHAWK®, MCPA, MCPB, 2,4-D, mecoprop, dichlorprop, BONANZA® and MANDATE®.

PROTUGAN can also be tank mixed with most commonly used insecticides and fungicides.
CAUTION:
Tank mixtures with other herbicides may result in crop damage.

MIXING:
Half fill the spray tank with clean water and begin agitating. Add the required quantity of PROTUGAN to the spray tank and add the remaining water. Continue agitation until spraying is complete. Ensure the sprayer and all measuring equipment is thoroughly cleaned after use with water and a wetting agent. Do not leave the sprayer standing with mixture in it.

For tank mixtures, add PROTUGAN first and mix thoroughly into the water. Add other products slowly one at a time with good agitation and ensure each is thoroughly mixed before adding the next product.

APPLICATION:
Apply in a water volume of 150-300 litres of water/Ha. Avoid overlapping as this can cause crop injury.

SOIL RESIDUES:
After harvest thoroughly cultivate soil before sowing subsequent crops. In the event of a winter crop failure through drought or disease, replant in the spring only with wheat after thorough cultivation.

RAINFALL:
Rainfall within 6 hours following treatment may reduce effectiveness.

IMPORTANT: This is not the registered label. Always read the label before using this product and follow label instructions.

For specialist advice in an EMERGENCY call 0800 734 607 (all hours).

Protugan is registered pursuant to the ACVM Act 1997, P8123. See www.foodsafety.govt.nz for registration conditions. Approved pursuant to the HSNO Act 1996, Approval No. HSR100044. See www.epa.govt.nz for approval controls.

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