

Container

|              |           |                  |
|--------------|-----------|------------------|
| <b>GROUP</b> | <b>27</b> | <b>HERBICIDE</b> |
|--------------|-----------|------------------|

## **SHIELDEX™ 400SC HERBICIDE**

**AGRICULTURAL**

**SUSPENSION CONCENTRATE**

A HERBICIDE FOR POSTEMERGENCE WEED CONTROL IN ALL TYPES OF FIELD  
CORN, SWEET CORN, SEED CORN AND POPCORN.

ACTIVE INGREDIENT: Tolpyralate 400 g/L

Contains 1,2-benzisothiazolin-3-one at 0.008% as a preservative

OR

Contains 2-Bromo-2-nitropropane-1,3-diol at 0.00352%

and

5-Chloro-2-methyl-4-isothiazolin-3-one at 0.00034%

and

2-Methyl-4-isothiazolin-3-one at 0.00011% as preservatives

**READ THE LABEL AND ATTACHED BROCHURE BEFORE USING**  
**KEEP OUT OF REACH OF CHILDREN**

REGISTRATION NO: 32943  
PEST CONTROL PRODUCTS ACT

Net Contents: 500 ml - 200 L

Registrant  
ISK Biosciences Corporation  
740 Auburn Road, Suite A  
Concord, Ohio 44077 USA  
1-877-706-4640

Shieldex is a trademark of Ishihara Sangyo Kaisha, Ltd.

## **NOTICE TO USER**

This pest control product is to be used only in accordance with the directions on the label. It is an offence under the ***PEST CONTROL PRODUCTS ACT*** to use this product in a way that is inconsistent with the directions on the label.

## **FIRST AID**

**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 the person to fresh air. If the 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.

**IF SWALLOWED:** Call a poison control centre or doctor immediately for treatment advice. Have the 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.

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

## **TOXICOLOGICAL INFORMATION**

There is no specific antidote for this product. Treat symptomatically.

## **PRECAUTIONS**

### **KEEP OUT OF REACH OF CHILDREN**

Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling. Remove and wash contaminated clothing before reuse. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove contaminated clothing and wash separately from other laundry before reuse.

During mixing, loading, application, clean-up and repair, workers must wear long-sleeved shirt and long pants, chemical-resistant gloves and shoes plus socks. Chemical – resistant gloves are not required inside a closed-cab during groundboom application. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove personal protection equipment (PPE) immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash

thoroughly and change into clean clothing. Keep and wash PPE separately from other laundry.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift.

For corn detasseling, do not enter or allow worker entry in to the treated areas for 2 days. For all other postapplication activities, do no re-enter the treated areas for 12 hours.

### **SPRAY DRIFT MANAGEMENT**

Apply only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature inversions, application equipment and sprayer settings.

### **ENVIRONMENTAL PRECAUTIONS**

TOXIC to aquatic organisms and non-target terrestrial plants. Observe buffer zones specified under DIRECTIONS FOR USE.

This product demonstrates the properties and characteristics associated with chemicals detected in ground water. The use of Shieldex 400SC Herbicide in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination.

To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.

Avoid application 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.

As this product is not registered for the control of pests in aquatic systems, DO NOT use to control aquatic pests.

DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

### **STORAGE**

To prevent contamination store this product away from food or feed.

## **CONTAINER DISPOSAL**

DO NOT reuse this container for any purpose. This is a recyclable container, and is to be disposed of at a container collection site. Contact your local distributor/dealer or municipality for the location of the nearest collection site. Before taking the container to the collection site:

1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Make the empty, rinsed container unsuitable for further use.

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### **SPRAY DRIFT MANAGEMENT**

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### **ENVIRONMENTAL PRECAUTIONS**

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To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.

Avoid application 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.

As this product is not registered for the control of pests in aquatic systems, **DO NOT** use to control aquatic pests.

**DO NOT** contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

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## **RESISTANCE MANAGEMENT**

Tolpyralate is an HPPD inhibitor herbicide (Group 27) which inhibits the synthesis of carotenoid biosynthesis. Naturally occurring biotypes of certain weed species with resistance to several herbicide modes of action (triazine, ALS, PPO, glyphosate, auxin, HPPD, and etc.) have been identified. The repeated use of herbicides with the same modes of action allow resistant weeds to be selected and spread. To manage the development and spread of herbicide resistant weed species, it is important to use herbicides with different modes of action either as tank mixes or in sequential applications and in rotations along with altering cultural practices.

To help reduce the development of resistance to Shieldex 400SC Herbicide, always follow full labeled rate and proper application timing listed on the label. When applying Shieldex 400SC Herbicide as a postemergence treatment after using an HPPD containing preplant/preemergence herbicide always tank mix tolpyralate with atrazine or another product with a different mode of action. Atrazine is a preferred tank mix partner and other herbicides can be tank mixed as needed to enhance efficacy.

To delay herbicide resistance:

- Herbicide use should be based on an integrated weed management program that includes scouting, historical information related to herbicide use and crop rotation, and considers tillage (or other mechanical control methods), cultural (for example, higher crop seeding rates; precision fertilizer application method and timing to favour the crop and not the weeds), biological (weed-competitive crops or varieties) and other management practices.
- Monitor weed populations after herbicide application for signs of resistance development (for example, only one weed species on the herbicide label not



- controlled). If resistance is suspected, prevent weed seed production in the affected area if possible by an alternative herbicide from a different group. Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment when moving between fields, and planting clean seed.
- Have suspected resistant weed seeds tested by a qualified laboratory to confirm resistance and identify alternative herbicide options.
  - Contact your local extension specialist or certified crop advisors for any additional pesticide resistance-management and/or integrated weed-management recommendations for specific crops and weed biotypes.
  - For further information or to report suspected resistance, contact ISK Biosciences Corporation at 877-706-4640.

## **DIRECTIONS FOR USE**

### **Product Specific Precautions:**

Read and understand the entire label before opening this product. If you have questions, call the manufacturer at 877-706-4640 or obtain technical advice from the distributor or your provincial agricultural representative. Application of the specific product must meet and/or conform to the following:

### **General Use Information:**

Shieldex 400SC Herbicide is a suspension concentrate for selective postemergence control of certain grass and broadleaf weeds in field corn, seed corn, sweet corn and popcorn. When applied postemergence, susceptible weeds uptake through treated foliage and cease growth soon after application. Complete death of weeds may take up to 2 weeks but will not compete with the growing crop.

### **Crop Tolerance**

Shieldex 400SC Herbicide has exhibited excellent crop tolerance in development trials. However, Shieldex 400SC Herbicide has not been tested on all inbred lines for tolerance. Contact your seed corn supplier for specific recommendations.

### **Cultivation**

Avoid disturbing treated areas for at least 7 days after Shieldex 400 SC Herbicide application to allow maximum herbicide uptake and translocation. Avoid deep cultivation that will move dormant weed seeds into a zone where germination is likely. This is especially critical when tank mixing with a herbicide with soil residual activity.

### **Environmental Conditions and Biological Activity**

Shieldex 400 SC Herbicide provides best results when applied to young, actively growing weeds. Applications made during warm, moist conditions (21°C or more) and adequate soil moisture both before and after application maximizes performance.

The degree and duration of control depend on spray coverage, weed spectrum, weed size, growing conditions before and after treatment and soil moisture.

Shieldex 400SC Herbicide is rainfast in 1 hour. Treating weeds that exceed maximum label height or that are under stress may result in incomplete control. Poor weed control or crop injury may result from applications made to plants under stress from:

- abnormally hot or cold weather
- environmental conditions such as drought, water-saturated soils, hail damage, or frost
- disease, insect, or nematode injury
- prior herbicide, or carryover from a previous year's herbicide application

If the corn or grass weeds are under stress, delay application until stress passes and both weeds and corn resume active growth.

### **Mixing and Loading Instructions:**

Prepare no more spray mixture than is needed for the immediate application. Avoid the overnight storage of Shieldex 400SC Herbicide spray mixtures.

1. Ensure the spray system is free of residues from previous applications.
2. Fill the tank 1/2 full of clean water.
3. While agitating, add the required amount of Shieldex 400SC Herbicide.
4. Continue agitation until the Shieldex 400SC Herbicide is completely dispersed, at least 5 minutes.  
Once the Shieldex 400SC Herbicide is fully dispersed, maintain agitation and continue filling tank with water. Thoroughly mix Shieldex 400SC Herbicide with water before adding any other material.
5. As the tank is filling, add the required spray adjuvants (methylated seed oil or ammonium nitrogen fertilizer).
6. If the mixture is not continuously agitated, settling will occur. If settling occurs, thoroughly re-agitate before using.
7. Avoid overnight storage of Shieldex 400SC Herbicide spray mixtures.

**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 S572.1) medium classification. Boom height must be 60 cm or less above the crop or ground.

**DO NOT** apply by air.

## SPRAY ADDITIVES

To increase efficacy it is highly recommended to use an adjuvant when applying this product.

### Adjuvant Selection

The use of MSO CONCENTRATE with Leci-Tech is recommended with Shieldex 400SC Herbicide.

Apply 1 % v/v or 10 L MSO CONCENTRATE per 1000 L of spray mixture.

### Buffer zones:

Spot treatments using hand-held equipment **DO NOT** require a buffer zone.

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) and sensitive freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands).

| Method of application | Crop  | Buffer Zones (metres) Required for the Protection of: |                  |                     |
|-----------------------|---|---|------------------|---------------------|
|                       |   | Freshwater Habitat of Depths:                         |                  | Terrestrial habitat |
|                       |   | Less than 1 m   | Greater than 1 m |                     |
| Field sprayer         | Field corn, sweet corn, seed corn and popcorn | 1   | 1                | 2                   |

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.

The buffer zones for this product can be modified based on weather conditions and spray equipment configuration by accessing the Buffer Zone Calculator on the Pest Management Regulatory Agency web site.

### Ammonium Nitrogen Fertilizer

- Overall weed control may be improved with the addition of a nitrogen source. Use 12.5 to 25 L/1000 L spray solution of a high-quality urea ammonium nitrate (UAN), such as 28% N or 32% N, or 8.4 to 20.4 kg/1000 L of a spray grade ammonium sulfate (AMS).
- Do not use liquid nitrogen fertilizer as the total carrier solution.

**Tank Mixtures:**

Tank mixes are generally used to broaden or extend control of the weed spectrum present. Tank mix herbicides must be registered for use on the intended crop. A tank mixture with atrazine is recommended unless atrazine is prohibited in the application area. An application of Shieldex 400SC Herbicide at 75 to 100 ml per hectare in combination with atrazine at least 0.56 kg ai per hectare will increase the speed of control, weed spectrum, and consistency of control. Do not apply atrazine if corn is greater than 30 centimeters.

Shieldex 400SC Herbicide may be tank mixed with other herbicides specified for use on corn. Read and follow all label directions for each tank mix herbicide. Always follow precautions and restrictions on the most restrictive tank mix partner. Shieldex 400SC Herbicide is generally compatible with insecticides (non-organophosphate), fungicides, fertilizers and micronutrient products provided sufficient free water is available for dispersion of all the tank mix products. However, the physical compatibility of Shieldex 400SC Herbicide with tank mix partners should be evaluated before use. Use tank-mix combinations only when applicator experience indicates that the tank mix will not result in objectionable crop injury.

For tank mixtures, add individual components to the spray tank in the following sequence: water, water dispersible granules, water-soluble bags, dry flowables, emulsifiable concentrates, drift control additives, water-soluble liquids, liquid fertilizer and/or ammonium sulfate, and adjuvants.

**Compatibility Test:**

Additives and tank mixes should be tested for compatibility by mixing in a small container prior to mixing in spray tank.

In a glass jar (~1 litre size), add all mix partners, in their relative proportions. Invert, shake or mix the jar thoroughly.

If mixture forms precipitates (flakes or sludge), gels, balls up or forms oily films or layers, this indicates incompatibility. Though signs of incompatibility will typically be seen within 5 minutes of mixing, mixture should be observed for approximately 30 minutes.

Compatibility agents can be used to facilitate mixing. If compatibility agents do not facilitate mixing, the mixture is incompatible and should not be used.

**Spray Equipment Clean Out:**

After spraying Shieldex 400SC Herbicide and before using sprayer equipment for any other applications, the sprayer must be thoroughly cleaned using the following procedure.

1. Drain tank; thoroughly rinse inside of spray tanks with clean water (rinse about 1 minute per 95 liters of tank capacity). Loosen and physically remove any visible deposits with a stiff brush.
2. Fill the tank with clean water and add 3.78 liters of household ammonia (contains at least 3% active ingredient) for every 379 liters of water. Circulate the cleaning

solution through the tank and hoses for at least 15 minutes. Flush the cleaning solution through the hoses, boom and nozzles (1/4 volume of tank capacity) and then drain the tank.

3. Repeat step 1.
4. Repeat step 2.
5. Remove the nozzles and screen and clean separately in a bucket containing cleaning agent and water.
6. Rinse the tank, boom and hoses with clean water.
7. If only ammonia is used as a cleaner, the rinsate solution from both steps 2 and 4 may be applied back to the crop(s) as specified on the label. Do not exceed the maximum label use rate. If other cleaners are used, consult the cleaner label for rinsate disposal instructions. If no instructions are given, dispose of the rinsate on site or at an approved waste disposal facility.  
(Attention: Do **Not** use Chlorine bleach with ammonia as a dangerous gas will form).

## **APPLICATION INFORMATION**

Many crops are highly sensitive to Shieldex 400SC Herbicide. All direct or indirect contact (such as spray drift) with crops other than corn should be avoided.

### **Sprayer Preparation**

Apply Shieldex 400SC Herbicide with spray equipment that has been cleaned and is free of pesticide deposits from previous pesticide use. Clean spray equipment according to manufacturer's directions, see previous pesticide label for appropriate cleanup directions.

For all application systems, use 50-mesh or larger strainer screens.

### **Postemergence Weed Control**

Applications for postemergence weed control should be made in 140 to 470 litres of water per hectare. Use the higher water volumes if vegetation or crop residue is present. Best results are obtained when weeds are small and actively growing. Broadleaf weeds should be no larger than 10 centimeters and grasses should be no taller than 10 centimeters and prior to first tillering. Good coverage is essential to achieve optimum weed control. Higher spray volumes should be used under heavy weed populations or under adverse growing conditions.

**Broadcast:** Apply Shieldex 400SC Herbicide using conventional low-pressure ground spray equipment. Follow manufacture's recommendation for spraying pressure and boom height. Check spray equipment daily for proper maintenance and calibration.

**Shielded Sprayers:** Shielding the boom or individual nozzles can reduce the effects of wind. However, it is the responsibility of the applicator to verify that the shields are preventing drift and not interfering with uniform deposition of the product.

## **APPLICATION RESTRICTIONS**

DO NOT apply this product by air or through any type of irrigation system.

DO NOT apply more than two applications of Shieldex 400SC Herbicide to corn in one growing season.

Allow at least 14 days between applications of Shieldex 400SC Herbicide.

DO NOT apply Shieldex 400SC Herbicide within 45 days of field corn and popcorn grain harvest.

DO NOT apply Shieldex 400SC Herbicide within 35 days of fresh market sweet corn harvest.

DO NOT graze or feed treated corn forage or silage for 21 days after application of Shieldex 400SC Herbicide.

## **FIELD CORN, SWEET CORN, AND POPCORN**

Shieldex 400SC Herbicide may be used in the production of field corn, sweet corn and popcorn. Shieldex 400SC Herbicide may be applied as a broadcast spray on corn up to 50 cm tall or that is exhibiting up to and including 6 leaf collars (V6), whichever is more restrictive. While Shieldex 400SC Herbicide has a wide application window in terms of crop safety, research has shown best results are obtained when applications are made early postemergence when corn and weeds are small. Target applications to corn that is less than 30 cm tall for improved coverage and best overall performance.

## **FIELD CORN GROWN FOR SEED**

Not all seed corn inbreds have been tested, nor does ISK Biosciences have access to all seed company data. Consequently, ISK Biosciences is not responsible for any crop injury arising from the use of Shieldex 400SC Herbicide on field corn grown for seed. When tank mixing, check the tank mix partner label for instructions for use.

### **Timing to Weeds**

Apply Shieldex 400SC Herbicide when susceptible weeds are young and actively growing, but before they exceed the sizes indicated in Table 1. Treat heavy infestations of weeds before they become too competitive with the crop, especially where soil moisture and/or fertility are limited. Shieldex 400SC Herbicide provides weed control via foliar absorption. Shieldex 400SC Herbicide has limited pre-emergence activity. For later-emerging weeds, a second application or a timely cultivation is required. Applications made to weeds larger than the size indicated on this label or to weeds under stress may result in unsatisfactory control.

### **Rate**

Optimum control of the weeds listed can be achieved with 75 to 100 ml Shieldex 400SC Herbicide per hectare (30 to 40 g ai/ha). Use of the higher rate for heavier infestations is recommended.

## **WEEDS CONTROLLED**

When applied as directed, Shieldex 400SC Herbicide will control or partially control the weeds listed in tables 1 and 2.

**Table 1. Broadleaf weeds controlled or suppressed with 75 to 100 ml Shieldex 400SC Herbicide per hectare**

|                                |                                 | Shieldex400SC<br>Herbicide                  | Shieldex<br>400SC<br>Herbicide<br>+ Atrazine <sup>1</sup> |
|--------------------------------|---------------------------------|---|---|
|                                |                                 | <b>75 to 100 ml per hectare<sup>2</sup></b> |   |
| Broadleaf Weeds<br>Common name | Scientific Name                 | Apply to weeds < 10 cm tall                 |   |
| Amaranth, Palmer               | <i>Amaranthus palmeri</i>       | S   | C   |
| Amaranth, Powell               | <i>Amaranthus powellii</i>      | S   | C   |
| Cocklebur, common              | <i>Xanthium strumarium</i>      | S-C*  | C   |
| Fleabane, Canada               | <i>Erigeron canadensis</i>      | S-C*  | C   |
| Lady's thumb                   | <i>Periscaria maculosa</i>      | S-C*  | C   |
| Lamb's quarters, common        | <i>Chenopodium album</i>        | S-C*  | C   |
| Mustard, wild                  | <i>Sinapsis arvensis</i>        | S   | C   |
| Pigweed, redroot               | <i>Amaranthus retroflexus</i>   | S-C*  | C   |
| Pigweed, smooth                | <i>Amaranthus hybridus</i>      | C   | C   |
| Purslane, Common               | <i>Portulaca oleracea</i>       | S   | C   |
| Ragweed, common                | <i>Ambrosia artemisiifolia</i>  | S   | C   |
| Ragweed, giant                 | <i>Ambrosia trifida</i>         | S   | C   |
| Shepherd's Purse               | <i>Capsella bursa-pastoris</i>  | S   | C   |
| Smartweed, Pennsylvania        | <i>Polygonum pennsylvanicum</i> | S   | S   |
| Velvetleaf                     | <i>Abuthilon theophrasti</i>    | C   | C   |
| Waterhemp, common              | <i>Amaranthus rudis</i>         | S   | C   |
| Waterhemp, tall                | <i>Amaranthus tuberculatus</i>  | C   | C   |

C = Control S = Suppression

<sup>1</sup>Use a minimum of 0.56 kg ai per hectare atrazine.

<sup>2</sup>Apply 100 ml per hectare for heavy weed pressure.

\* Suppression at 75 ml/ha, control at 100 ml/ha

**Table 2. Grasses controlled or suppressed with 75 to 100 ml Shieldex 400SC Herbicide per hectare**

|                        |                               | Shieldex<br>400SC<br>Herbicide                       | Shieldex<br>400SC<br>Herbicide<br>+<br>Atrazine <sup>1</sup> |
|------------------------|-------------------------------|--|--|
|                        |                               | <b>75 to 100 ml per hectare<sup>2</sup></b>          |  |
| Grasses<br>Common name | Scientific Name               | Apply to grasses < 10 cm tall<br>or before tillering |  |
| Barnyardgrass          | <i>Echinochloa crus-galli</i> | S  | S  |
| Crabgrass, large       | <i>Digitaria sanguinalis</i>  | C  | C  |
| Foxtail, giant         | <i>Setaria faberi</i>         | S  | S  |
| Foxtail, green         | <i>Setaria viridis</i>        | S-C*   | S-C*   |
| Foxtail, yellow        | <i>Setaria pumila</i>         | S  | S  |

C = Control S = Suppression

<sup>1</sup>Use a minimum of 0.56 kg ai per hectare atrazine.

<sup>2</sup>Apply 100 ml per hectare if under heavy weed pressure

\* Suppression at 75 ml/ha, control at 100 ml/ha

### Rotational Crop Information

The following crop rotational crops may be planted after applying Shieldex 400 SC Herbicide at the labeled application rates in corn as shown table. If Shieldex 400 SC Herbicide is tank mixed with other products, follow the most restrictive crop's rotation interval.

Table 3. Time interval between Shieldex 400 SC Herbicide and replanting or planting of rotational Crops

| Crop  | Replant/Rotational interval |
|---|-----------------------------|
| Corn, sweet corn, seed corn and popcorn   | Immediate                   |
| Winter Wheat<br>Rye (annual and fall)   | 3 months                    |
| Alfalfa<br>Barley<br>Bean, dry<br>Bean, green (including seed production)<br>Cabbage<br>Canola, rapeseed<br>Cotton<br>Grass, grown for seed or forage<br>Oats |                             |



|   |           |
|---|-----------|
| Peas, field and edible<br>Peanut<br>Potato<br>Rice<br>Snap beans<br>Sorghum<br>Soybean<br>Cucurbits<br>Sunflower<br>Tomato<br>Wheat, spring | 9 months  |
| Sugar beets   | 18 months |
| All other rotational crops  | 12 months |