READ THE ENTIRE LABEL BEFORE USING THIS PRODUCT.

USE ONLY IN ACCORDANCE WITH INSTRUCTIONS.

KEEP OUT OF REACH OF CHILDREN

VIKING 48 SL

INGREDIENTS
Glyphosate ……..48%
Other ingredients ……..52%

VIKING 48 SL is a **cost effective and simple method to control most weeds** and contains as its active ingredient Glyphosate 48 SL. It is easy to transport by sea and air.

VIKING 48 SL is a broad-spectrum, nonselective systemic herbicide used for control of annual and perennial plants including grasses, sedges, broad-leaved weeds, and woody plants. It can be used on non-cropland as well as on a great variety of crops.

VIKING 48 SL can be used to control weeds on the farm, the golf course and in home gardens, create sustainable agricultural systems that preserve top soil, help retain soil moisture, and provide a valuable tool for integrated pest management programs. They can be used to help prepare deforested land for reforestation, reclaim land for grazing or agriculture that has been taken over by weeds, restore wildlife habitats, control roadside vegetation and rid school yards and parks of noxious weeds like poison ivy, among many other uses.

VIKING 48 SL can be used before, during or after planting on the following cereal crops: Rice (prior to planting only, no spot treatment, when field contains water do not treat rice fields or leaves), Barley, Buckwheat, Millets, Oats, Rye, Triticale, Wheat etc.

Other crops that VIKING 48 SL can be used on are: Cotton, Grain Sorghum, Sugarcane, Oilseed Crops (Sunflower, Safflower, Sesame, Mustard, Canola, Flax), Herbs & Spices like Allspice, Star Anise, Basil, Camomile, Cassia Bark, Cassia buds, Cinnamon, Celery seed, Coriander leaf, Coriander seed, Costmary, Cumin, Curry leaf, Fenugreek, Lemongrass, Marigold, Pepper leaves, Peppermint, Sweet Bay, Vanilla etc.

Fruiting Vegetables like Egg Plant, Bell Pepper, Chilli Pepper, Pimento, Tomato require 3 days between application of VIKING 48 SL and planting. Legume vegetables like Bean, Blackeyed Pea, Mung Bean, Rice Bean, Broadbean, Chickpea, Swordbean can also be treated with VIKING 48 SL. VIKING 48 SL can be also used on tuber crops like Beet, Carrot, Chicory, Ginger, Horseradish, Parsley, Potato, Radish, Sweet Potato, Turnip, Yam and on Brassica Vegetables like Broccoli, Brussel sprouts, Cabbage and Cauliflower, and on Bulb Vegetables like Garlic, Leek, Onion and on Cucurbit Vegetables and Fruits like Cucumber, Gherkin, all melons, and other crops like Pineapple, Strawberry and Sugarbeet. VIKING 48 SL is commonly used in Citrus, Pome Fruit, Stone Fruit, Tree Nuts (Almond), Vine Crops (grapes, kiwi, passion fruit) and non food Tree Crops like Pine and Eucalyptus.

Trade Names Of Other Firms**:** Trade names for products containing glyphosate include Gallup, Landmaster, Pondmaster, Ranger, Roundup, Rodeo, and Touchdown. It may be used in formulations with other herbicides.

What is VIKING 48 SL and how does it work?

Glyphosate-based herbicides work on the biochemical principle -- they inhibit a specific enzyme that plants need in order to grow. The specific enzyme is called **EPSP synthase**. Without that enzyme, plants are unable to produce other proteins essential to growth, so they yellow and die over the course of several days or weeks. A majority of plants use this same

enzyme, so almost all plants succumb to Roundup.

In the same way that many antibiotics gum up enzyme production to kill bacteria, glyphosate gums up enzymes in plants to kill them. Glyphosate kills plants like antibiotics kill bacteria.

VIKING 48 SL moves from the point where it is applied to the root system and effects can be seen in 2-4 days (or in 7 days on persistent perennial weeds). Weeds are best controlled when they are young (small). Heavy rainfall soon after application may wash the product off the surface of the foliage and the application may have to be repeated.

Key Benefits of VIKING 48 SL:

1) Trusted performance. Reliable.
2) VIKING 48 SL will kill almost any plant, including aquatic plants, so you want to be sure to avoid spray drift onto other plants or into water. Any pesticide should be applied carefully.
3) Used worldwide by major partners.

PRECAUTIONS

Causes moderate eye irritation. Do not get in eyes.Harmful if swallowed or absorbed through the skin. Keep out of reach of children.
Wear overalls over long pants, and a long-sleeved shirt, goggles or a face shield, apron and chemical resistant gloves during mixing, loading, clean-up and repair activities. Wear pants, a long-sleeved shirt and chemical resistant gloves during application.
Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

SYMPTOMS OF POISONING

Irritation on skin or eyes.

MEDICAL TREATMENT

if ingested, induce emesis or lavage stomach. Treat symptomatically.

FIRST AID

If poisoning is suspected, immediately contact a physician or a poison control centre. Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.
If skin contacts, wash exposed areas of skin with soap and warm water. This product may produce temporary allergic side effects characterised by redness of the eyes, mild bronchial irritation and redness or rash on exposed skin areas. Persons having allergic reaction should contact a physician immediately.
If eyes contact, flush for 15-20 minutes with large amount of water and seek medical attention immediately. If inhaled, remove patient to fresh air. In all cases, notify a physician and present this label.

DIRECTIONS OF USE

VIKING 48 SL mixes well with water. To mix spray solutions, fill the spray or mixing tank with water (as specified) and towards the end of the filling process add VIKING 48 SL and mix well.

Sugarcane: VIKING 48 SL can be used at preplanting stage, pre-emergence stage and at-planting stages. This product can be applied in and around sugarcane fields or in the fields prior to emergence of the plant cane. A 1% solution of VIKING 48 SL is recommended for spot control in Sugarcane wherein care should be taken to avoid spraying on healthy plants.

VIKING 48 SL is compatible in tank mixtures with ZANTAN 72 (2,4 D 72%).

For fallow treatments to remove the last rubble of ratoon cane add 4 ltrs of VIKING 48 SL in 10 to 40 gallons of water to new growth having at least 7 leaves. Allow about 1 week before tillage.

Bermuda Grass: For burndown of Bermuda Grass use about 2 ltrs of VIKING 48 SL in about 20 gallons of water per acre.

Vegetable Crops: VIKING 48 SL can be used in chemical fallow applications, in between rows, prior to planting or pre-emergence, prior to transplanting. Seedlings of desired crop will perish if VIKING 48 SL is sprayed on them.

DISPOSAL METHODS

Do not contaminate water, food or feed by storage of disposal. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, completely empty bag into application equipment. Dispose of empty bag and box in a sanitary landfill or by incernation, or if allowed by state or local authorities, by burning. Stay out of smoke from burning containers.

STORAGE CONDITION

Store in the closed, original container in a cool, well-ventilated area. Do not store for prolonged periods in direct sunlight. Store in a locked room or place away from children, animals, flood,

feedstuffs, seed and fertilizers. Triple or preferably pressure rinse containers before disposal. Add rinsing to spray tank.

For More Details including effects on envioronment email contact@ivorychem.com with Subject “VIKING 48 SL DETAILS”

More Details:

TOXICOLOGICAL EFFECTS

- **Acute toxicity:** Glyphosate is practically nontoxic by ingestion, with a reported acute oral LD50 of 5600 mg/kg in the rat. The toxicities of the technical acid (glyphosate) and the formulated product (Roundup) are nearly the same [58,96]. The oral LD50 for the trimethylsulfonium salt is reported to be approximately 750 mg/kg in rats, which indicates moderate toxicity [58]. Formulations may show moderate toxicity as well (LD50 values between 1000 mg/kg and 5000 mg/kg) [58]. Oral LD50 values for glyphosate are greater than 10,000 mg/kg in mice, rabbits, and goats [8,96]. It is practically nontoxic by skin exposure, with reported dermal LD50 values of greater than 5000 mg/kg for the acid and isopropylamine salt. The trimethylsulfonium salt has a reported dermal LD50 of greater than 2000 mg/kg. It is reportedly not irritating to the skin of rabbits, and does not induce skin sensitization in guinea pigs [58]. It does cause eye irritation in rabbits [58]. Some formulations may cause much more extreme irritation of the skin or eyes [58]. In a number of human volunteers, patch tests produced no visible skin changes or sensitization [58]. The reported 4-hour rat inhalation LC50 values for the technical acid and salts were 5 to 12 mg/L [58], indicating moderate toxicity via this route. Some formulations may show high acute inhalation toxicity [58]. While it does contain a phosphatyl functional group, it is not structually similar to organophosphate pesticides which contain organophosphate esters, and it does not significantly inhibit cholinesterase activity [1,58].
- **Chronic toxicity:** Studies of glyphosate lasting up to 2 years, have been conducted with rats, dogs, mice, and rabbits, and with few exceptions no effects were observed [96]. For example, in a chronic feeding study with rats, no toxic effects were observed in rats given doses as high as 400 mg/kg/day [58]. Also, no toxic effects were observed in a chronic feeding study with dogs fed up to 500 mg/kg/day, the highest dose tested [58,97].
- **Reproductive effects:** Laboratory studies show that glyphosate produces reproductive changes in test animals very rarely and then only at very high doses (over 150 mg/kg/day) [58,96]. It is unlikely that the compound would produce reproductive effects in humans.
- **Teratogenic effects:** In a teratology study with rabbits, no developmental toxicity was observed in the fetuses at the highest dose tested (350 mg/kg/day) [97]. Rats given doses up to 175 mg/kg/day on days 6 to 19 of pregnancy had offspring with no teratogenic effects, but other toxic effects were observed in both the mothers and the fetuses. No toxic effects to the fetuses occurred at 50 mg/kg/day [97]. Glyphosate does not appear to be teratogenic.
- **Mutagenic effects:** Glyphosate mutagenicity and genotoxicity assays have been negative [58]. These included the Ames test, other bacterial assays, and the Chinese Hamster Ovary (CHO) cell culture, rat bone marrow cell culture, and mouse dominant lethal assays [58]. It appears that glyphosate is not mutagenic.
- **Carcinogenic effects:** Rats given oral doses of up to 400 mg/kg/day did not show any signs of cancer, nor did dogs given oral doses of up to 500 mg/kg/day or mice fed glyphosate at doses of up to 4500 mg/kg/day [58]. It appears that glyphosate is not carcinogenic [97].
- **Organ toxicity:** Some microscopic liver and kidney changes, but no observable differences in function or toxic effects, have been seen after lifetime administration of glyphosate to test animals [97].
- **Fate in humans and animals:** Glyphosate is poorly absorbed from the digestive tract and is largely excreted unchanged by mammals. At 10 days after treatment, there were only minute amounts in the tissues of rats fed glyphosate for 3 weeks [98]. Cows, chickens, and pigs fed small amounts of glyphosate had undetectable levels (less than 0.05 ppm) in muscle tissue and fat. Levels in milk and eggs were also undetectable (less than 0.025

ppm). Glyphosate has no significant potential to accumulate in animal tissue [99].

ECOLOGICAL EFFECTS

- **Effects on birds:** Glyphosate is slightly toxic to wild birds. The dietary LC50 in both mallards and bobwhite quail is greater than 4500 ppm [1].
- **Effects on aquatic organisms:** Technical glyphosate acid is practically nontoxic to fish and may be slightly toxic to aquatic invertebrates. The 96-hour LC50 is 120 mg/L in bluegill sunfish, 168 mg/L in harlequin, and 86 mg/L in rainbow trout [58]. The reported 96-hour LC50 values for other aquatic species include greater than 10 mg/L in Atlantic oysters, 934 mg/L in fiddler crab, and 281 mg/L in shrimp [58]. The 48-hour LC50 for glyphosate in Daphnia (water flea), an important food source for freshwater fish, is 780 mg/L [58]. Some formulations may be more toxic to fish and aquatic species due to differences in toxicity between the salts and the parent acid or to surfactants used in the formulation [58,96]. There is a very low potential for the compound to build up in the tissues of aquatic invertebrates or other aquatic organisms [96].
- **Effects on other organisms:** Glyphosate is nontoxic to honeybees [1,58]. Its oral and dermal LD50 is greater than 0.1 mg/ bee [98]. The reported contact LC50 values for earthworms in soil are greater than 5000 ppm for both the glyphosate trimethylsulfonium salt and Roundup [58].

ENVIRONMENTAL FATE

- **Breakdown in soil and groundwater:** Glyphosate is moderately persistent in soil, with an estimated average half-life of 47 days [58,11]. Reported field half-lives range from 1 to 174 days [11]. It is strongly adsorbed to most soils, even those with lower organic and clay content [11,58]. Thus, even though it is highly soluble in water, field and laboratory studies show it does not leach appreciably, and has low potential for runoff (except as adsorbed to colloidal matter) [3,11]. One estimate indicated that less than 2% of the applied chemical is lost to runoff [99]. Microbes are primarily responsible for the breakdown of the product, and volatilization or photodegradation losses will be negligible [58].
- **Breakdown in water:** In water, glyphosate is strongly adsorbed to suspended organic and mineral matter and is broken down primarily by microorganisms [6]. Its half-life in pond water ranges from 12 days to 10 weeks [97].
- **Breakdown in vegetation:** Glyphosate may be translocated throughout the plant, including to the roots. It is extensively metabolized by some plants, while remaining intact in others [1].

PHYSICAL PROPERTIES AND GUIDELINES

Physical Properties:

- **Appearance:** Glyphosate is a colorless crystal at room temperature [1].
- **Chemical Name:** N-(phosphonomethyl) glycine [1]
- **CAS Number:** 1071-83-6
- **Molecular Weight:** 169.08
- **Water Solubility:** 12,000 mg/L @ 25 C [1]
- **Solubility in Other Solvents:** i.s. in common organics (e.g., acetone, ethanol, and xylene) [1]
- **Melting Point:** 200 C [1]
- **Vapor Pressure:** negligible [1]
- **Partition Coefficient:** -3.2218 - -2.7696 [58]
- **Adsorption Coefficient:** 24,000 (estimated) [11]

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