

Parks & Public Landscaping Advisory Board

Agenda

**June 4, 2025
Library Meeting Room
951 Spruce Street
6:30 PM**

Members of the public are welcome to attend and give comments remotely; however, the in-person meeting may continue even if technology issues prevent remote participation.

- You can call in to **+1 408 638 0968 or 833 548 0282 (Toll Free)**, Webinar ID # 885 1622 9475
- You can log in via your computer. Please visit the City's website here to link to the meeting: www.louisvilleco.gov/pplab

The Board will accommodate public comments during the meeting. Anyone may also email comments to the Board prior to the meeting at AMcneal@LouisvilleCO.gov.

- I. Call to Order
- II. Roll Call
- III. Approval of Agenda
- IV. Approval of Minutes
- V. Public Comments on Items Not on the Agenda
- VI. PROS Marketing: Ginger Cross, staff report
- VII. Pesticides- discussion continued from May meeting- Staff report
- VIII. August PPLAB meeting
- IX. Board Report

Persons planning to attend the meeting who need sign language interpretation, translation services, assisted listening systems, Braille, taped material, or special transportation, should contact the City Clerk's Office at 303.335.4574 or clerksoffice@LouisvilleCO.gov. A forty-eight-hour notice is requested.

Si requiere una copia en español de esta publicación o necesita un intérprete durante la reunión, por favor llame a la Ciudad al 303.335.4536 o 303.335.4574 or email Clerksoffice@louisvilleco.gov

- X. Staff Report
- XI. Discussion Items for Next Meeting
- XII. Adjourn

Parks and Public Landscaping Advisory Board Meeting Minutes

Wednesday, May 7, 2025, 6:30pm

Library 1st Floor Meeting Room

951 Spruce St.

I. Call to Order

Meeting called to order by Chair Jody Ash at 6:30 PM

II. Roll Call

Ash, Jody, Chair, Present

Buck, Signe, Present

Denat, Julien, Present

Kelsey, Kathy, Present

Kutscher, Gene, Present

Webb, John, Secretary, Present

McNeal, Abby, Parks Superintendent, Present

Blackmore, Adam, Parks and Open Space Director, Present

Guests:

Judi Kern, Louisville Council member

Beth Armbruster, Louisville community member

Lisa Hughes, Louisville resident, Cornerstone

Susan McEchern, Louisville resident

Tim Gilpin, Louisville resident

Students from Monarch H.S. Government class

III. Approval of Agenda

Moved, seconded and approved

IV. Approval of Minutes

Moved, seconded and approved

V. Public Comments on Items Not on the Agenda

Comments from Community members:

Beth Armbruster, regarding a native plant garden at the Arboretum and landscaping around arboretum. Beth requested to have more pollinator-friendly plants. Not in love with Bermuda grass but would appreciate mulch around rock landscaped area and addition of pollinator plants. This would improve appearance and enjoyability more than just. Beth would appreciate pollinator plants that would complement other landscape elements, including additional purchase of Garden in a Box, improving pollinator habitat by close spacing. East side area could be devoted to demonstration gardens for homeowners and the public to enjoy!

VI. Cornerstone Community Landscape Bed Renovations at Eldorado Lane

a. Review design and planting list

Abby reported that Staff has redesigned plant selections for Cornerstone area for diversity of species, with focus on perennial plants, water conservation, and fire wise ratings.

Staff is working with new fire wise criteria, learning to be mindful of plant lists using fire wise criteria. Staff applied this new information to revise plant selection. Plants under consideration are summarized on the plant list in this month's meeting packet.

Staff completed redesign of Cornerstone bed at McCaslin/Via Apia stop light and two planting beds at the Eldorado entrance. Staff included Miss Kim lilac to balance the Lilac that survived the fire, in spite of non-native origin and poor fire wise rating.

Staghorn sumac grows well in a rock landscaped area and can tolerate a lot of heat in that setting. Staghorn has good survival characteristics. Existing plants will be moved to another area.

Eldorado entrance features a full rock bed surface. Serviceberry has done well in that area and is a fire survivor. Yucca is drought tolerant.

Plans include adding 2 white and 2 pink crab apples to match the surviving crab apple trees. Staff will be using larger plants in hopes of increasing survival and plans to upgrade irrigation in the planting area.

Timing of future construction in the northern part of the McCaslin/ Via Apia intersection where hillside is sliding onto city property and sidewalk where structural issues need repair may delay part of the restoration of the Cornerstone planting. City will replant as access becomes available, but completion date is indefinite.

Signe commented that Staghorn sumac could be invasive.

Staff commented that serviceberries, cotoneaster, and mock orange shrubs are considered native, Miss Kim lilac survived the fire, seems OK to move ahead with current plan.

Staff noted that any requested changes will delay project completion.

Comments from Lisa Hughes, resident of cornerstone. No HOA in that development. Expressed Thanks for efforts to replant, and happy to see progress. Please refer to Public comments received by Parks Department. Currently provided bed sketches hard to locate in the planting area. Reference to a photograph would be nice!

Residents are wondering how City will be working with east side trees that have survived the fire? How will those be accommodated? Concerned that data for Native plants reference eastern seaboard and are not appropriate for Colorado. Cornerstone community has worked hard to receive a Fire Wise community designation, and does not want to risk losing that designation. Community members suggest that the CSU plant list and CSU Fire-resistant data is the best to use.

Cornerstone does not want pinion pines replaced at the corner of Via Apia. These were taken out, so no problem!
Cornerstone community is grateful for City's design work on the rest of the perimeter.

Staff noted that planting is intended to begin in the next 2 months.

Judi: Will any design changes be implemented this year?

Staff: Yes.

Judi continued: Cornerstone has no community park, the entry areas are the only places to gather to talk and serve as a school bus stop. Judi would prefer Bermuda grass and suggests keeping pollinator plants away

from the bus stop to avoid bee sting hazards. To maintain Firewise designation, every single planting in the community must be a fire wise plant!

Staff: Staff spent a lot of time on Fire wise plant selection. The listings are sometimes conflicting, causing additional confusion and staff effort.

Jody: The Fire Wise designation is very important to the community, City needs to honor and support the community wishes.

Staff: Lilac was only selected to balance the bed, if not chosen, staff would need to remove and relocate the existing lilac.

VII. Review of Louisville Municipal Code Ordinance 08.08.010

a. Monarch Butterflies and Milkweed submittal - review

John presented a verbal summary of the monarch and milkweed submittal that appeared in the meeting packet, highlighting the importance of showy milkweed and other native milkweed species in the continued survival of the monarch butterfly. Important points include that showy milkweed is native to Colorado, is an important element of the prairie ecosystem, serves as the only food for monarch larvae, and is an important source of nectar for adult monarch butterflies and other pollinators. Milkweed is not included in the USDA, Colorado, or Boulder County noxious weed lists. The CSU Agricultural Extension has listed showy milkweed as Plant of the Month (see meeting packet for details). For these reasons, it is important that milkweed be removed from the City's noxious weed list. The propensity of showy milkweed for spreading in City planting beds can be controlled by hand removal of problem plants.

Staff commented that the listing of milkweed is a city ordinance and City Council action is needed to modify an ordinance. The ordinance is part of the building code, administered by the planning department.

Gene: Recommended taking milkweed off the weed list to avoid a problem.

Signe: Asked if Milkweed could be grown in pot?

Julien: Suggested that tropical milkweed be specified on the weed list due to its invasive properties.

John noted that tropical milkweed is not native to Colorado, would only appear in ornamental applications, and is discouraged by monarch

conservation organizations due to pathogens associated with tropical milkweed that are toxic to monarch butterfly larvae. John recommended that tropical milkweed not be specifically cited in a revised ordinance.

Jean Morgan, Louisville resident of the Miner's Field neighborhood supports removal of milkweed from the city noxious weed list and noted that even though monarchs are on the decline, she still has some visiting milkweed on her property. Please leave milkweed for the monarchs.

b. Vote on memo statement- need actual statement read by Chair

January 28th, 2025, a letter was received from a concerned resident pertaining to Louisville Code of Ordinances to remove milkweed from the Louisville 'Weed' list.

May 7th, 2025, at the request of Bee City and concerned residences, the Parks and Public landscaping Advisory Board reviewed the request and approved 5 to 1 that Milkweed has great value as a plant in our ecosystem.

The board highly recommends an amendment to remove all Milkweed from being designated as a weed in Louisville.

VIII. Pesticide Usage - discussion

Louisville standards for pesticide use and Integrated Weed Management Protocol (IWMP) for Parks and Open Space was included in the meeting packet.

Abby read through the management protocol.

Jody: PPLAB needs to be able to collect the Safety Data Sheets (SDS) for the list of pesticides that the Parks Department has provided. It is important that specific formulations of the trade named chemicals be made public, so that the public can have input on what chemicals are safe and appropriate.

Transparency of pesticide use is imperative going forward. Boulder posts its pesticide usage online. People are really concerned about chemical pesticide use.

Gene: Expressed feeling overwhelmed by the current political culture that is not supportive of the environment and is very worried about the future.

Signe: Expressed concerns about the poisoning of prairie dogs and the long term effect on the environment.

Jody: Sustainability is an important issue. Pesticides not sustainable. Pesticides accumulate in the soil and destroy the soil microbiome. The soil microbiome within the soil are the largest sequesters of CO₂. Pesticide use is killing the microbiome. We need to support pollinators, wildlife, and to reduce pollution from landscaping chemicals. Now is the time.

Susan McEchern, Louisville resident of Ward 3 asked that the City be more transparent with the weed management plan. Abby has provided much better information than what is on the city website! The city website links to the Boulder County website. Louisville's 1992 plan needs to be updated. The website update needs to be as transparent as possible, including current chemicals that are in use, and notice of scheduled applications. The 2024 IWMP is a great resource. Please minimize the use of chemicals as much as possible. The Parks Dept. might be able to apply for a grant from the Sustainable Parks Program administered by Beyond Pesticides. These grants provide free training, and support for two pilot projects for evaluating pesticide free park management. This is a great opportunity for training and learning to reduce pesticides.

There is a webinar presented by Beyond Pesticides scheduled for next Thursday, time TBD, if anyone else wants to join.

Tim Gilpin: The provided list of chemicals has trade names, but the public needs the active ingredients to fully evaluate the hazards. The city should post SDS on the city website, so that the information is clearly visible for community members.

Pesticides will kill off most of the microbiome, leaving 5 species remaining out of the thousands that were originally present. The main storage of CO₂ has been soil for millions of years. Tim's credentials include working as an atmospheric chemist, named along with Al Gore in the 1998 Nobel Prize for work on the global CO₂ cycle, and work with NCAR, NOAA, and Scripps Institute for many years. Tim is a specialist in soil microbiome.

Beth Armbruster, Louisville community member: Her Dad put down weed and feed, which was the traditional method of managing dandelions. Now the city of Louisville is allowing dandelions to grow. Beth questioned details of the lawn management code. Could the city allow taller grass, reduce mowing and irrigation, and stop using chemicals to control dandelions?

Tim Gilpin: Dandelions are a broadleaf, deep-rooted plant that breaks up rock, and creates soil through time. Dandelions have come back to finish the job!

Susan McEchern: Likes city pesticide information that has been provided.

Adam: IWMP is due for staff update, including public meetings. Could be added to city council's work plan in 2026, including a study session and staff presentations. May 27 is the first Council meeting scheduled for discussion of the 2026 Council work plan. Adam supports community involvement.

John composed the following memo for a PPLAB vote and submittal to City Council:

Memo to Louisville City Council:
May 7, 2025

PPLAB requests that City Council add to the Work plan of the review of Louisville's Integrated Weed Management Plan and the continued use or discontinuance of pesticides currently in use by Parks and Open space Departments.

The text of the memo was approved unanimously by members of PPAB by voice vote.

IX. Board Report

Bee Louisville City USA Committee hosted an information and children's activity table at the Lafayette Earth Day, Every Day festival.

John participated along with many members of city Staff to help plant 5 trees at the Arboretum.

Bee City did not receive a grant from People and Parks Action Network for the proposed Louisville Elementary School pollinator garden, but we do have local support to move ahead when the project is approved by Boulder County School District.

Bee City Pollinator Art contest kicks off this month, and will run through May and June with Louisville Library involvement

Julien and Gene met with the Parks and Rec board regarding the Pickle Ball situation. RAB recommended that RAB committee chair convey to Louisville mayor to convey an adequate opportunity for proponents to comment. Seventy

people appeared to advocate for pickleball facilities. RAB passed a resolution and continued to advocate to build a 5th tennis court at Centennial Park. No RAB meeting this month.

X. Staff Report

a. Follow up items:

Updated Planting List: [2025 Perennial-Shrub list.xls](#)

- b.** Council approved the long-range plan for Parks, which was overdue from 2012. Parks Dept. is working with a consultant to flesh out plan. There will be a full open house for community feedback in early to mid-Summer, with the initial meeting this Monday. Parks expects a 24 to 16 month process, including evaluation of Parks, Open Space, Seniors, and Golf Course. Parks will be using the same consultant for a first ever trails plan for our community, which is needed to satisfy the city charter original plan. Plan will consider trail maintenance, ecological zones and connectivity. Result will be a nice guide for our overall trail system. Parks will be integrated with the Trails plan. Parks will go to council for project update and adoption. Special meeting of Council on May 27th, at 6PM to evaluate 2025 progress and begin 2026 work plan. Council Budget retreat is scheduled for Jul. 23. It is important for PPLAB board members to be aware of finances for the coming years. Council will be addressing Parks long-term funding June 19, 4-6 PM on finance committee and city council agenda.
- c.** Arboretum – 2026 Capital Improvement Project in progress
- d.** Updated plant list, will be updated tomorrow with fire-wise characteristics
- e.** Additional Staff updates are in packet. May will be busy for horticulture and streetscapes teams. Using Resource Central Garden in a Box for west side of arboretum and additional Garden in a Box planting around our community.
- f.** Downtown hanging baskets and corner pots will be planted by staff and distributed downtown.
- g.** Permits for shelters busy for mid-May and Summer events.
- h.** The recent rain is welcome but delayed mowing operations.
- i.** Activating irrigation systems.
- j.** Arboretum planting rescheduled due to weather, completed planting 12 trees.
- k.** Playground projects are moving along, Sunflower expected to be completed the week of May 29th, with Enclave shortly after.
- l.** Abby will bring Marketing Manager of Communications to PPLAB to meet and greet next month.
- m.** June 12 is new Finance Committee meeting date.

- n. Arboretum 2026 capital improvement plan is in development by internal staff.

XI. Discussion Items for Next Meeting

- a. Possibly take August off depending on quorum and Agenda
- b. Pesticides
- c. Ginger Cross presentation

XII. Adjourn

Meeting adjourned at 8:40PM

Submitted by Jody Ash as an educational example of pesticide awareness and safety from Beyond Pesticides

Children and Pesticides Don't Mix

Children are especially vulnerable to pesticides

- The National Academy of Sciences reports that children are more susceptible to chemicals than adults and estimates that 50% of lifetime pesticide exposure occurs during the first five years of life.¹
- EPA concurs that children take in more pesticides relative to body weight than adults and have developing organ systems that are more vulnerable and less able to detoxify toxic chemicals.²
- Infants crawling behavior and proximity to the floor account for a greater potential than adults for dermal and inhalation exposure to contaminants on carpets, floors, lawns, and soil.³
- Children with developmental delays and those younger than six years are at increased risk of ingesting pesticides through nonfood items, such as soil.⁴
- Pre-natal exposure to the herbicide atrazine are associated with fetal growth restriction and small head circumference and fetal growth restriction.⁵
- A 2010 analysis observed that women who use pesticides in their homes or yards were two times more likely to have children with neural tube defects than women without these reported exposures.⁶
- Studies find that pesticides such as the weedkiller 2,4-D pass from mother to child through umbilical cord blood and breast milk.⁷
- Consistent observations have led investigators to conclude that chronic low-dose exposure to certain pesticides might pose a hazard to the health and development of children.⁸
- The World Health Organization (WHO) cites that over 30% of the global burden of disease in children can be attributed to environmental factors, including pesticides.⁹
- A 2010 meta-analysis of 15 studies on residential pesticide use and childhood leukemia finds an association with exposure during pregnancy, as well as to insecticides and herbicides. An association is also found for exposure to insecticides during childhood.¹¹
- A 2013 study suggests that preconception pesticide exposure, and possibly exposure during pregnancy, is associated with an increased risk of childhood brain tumors.¹²
- According to a 2015 study, living in agricultural regions is linked to increased leukemia and central nervous system cancers in children.¹³
- A meta-analysis study by scientists at the Harvard University's School of Public Health finds that children's exposure to pesticides in and around the home results in an increased risk of developing certain childhood cancers. Authors found that cancer risks were connected most closely to the type of pesticide used and the location where it was applied.¹⁴
- The probability of an effect such as cancer, which requires a period of time to develop after exposure, is enhanced if exposure occurs early in life.¹⁵
- A study published in the *Journal of the National Cancer Institute* finds that household and garden pesticide use can in-

Commonly Used Chemicals

Chemical	Common Use	Health Effects
2,4-D	Lawns	c, ed, r, n, kl, si, bd
Dicamba	Lawns	r, n, kl, si, bd
Fipronil	Indoor/outdoor baits, pet care	c, ed, n, kl, si
Glyphosate	Lawns	c, r, n, kl, si
Permethrin	Mosquitoes, head lice, garden	c, ed, r, n, kl, si

Key: Birth/developmental defects=bd; Kidney/liver damage=kl; Sensitizer/irritant=si; Cancer=c; Neurotoxicity=n; Endocrine Disruption=ed; Reproductive effects=r

Alternatives

Reduce exposure to toxic chemicals by adopting sound organic or integrated pest management (IPM) practices that use cultural, mechanical and biological methods of control and least-toxic chemicals only as a last resort. An organic diet limits children's pesticide exposure and toxic body burden.

Children, cancer and pesticides

- In 2015, WHO found that there was sufficient evidence of carcinogenicity in experimental organisms to classify glyphosate, the active ingredient in the most popular lawncare brand (Roundup) as "probably carcinogenic to humans" (Group 2A). WHO also found that 2,4-D- found in many 'weed and feed' products- is possibly carcinogenic.¹⁰

Studies show children's developing organs create "early windows of great vulnerability" during which exposure to pesticides can cause great damage.



crease the risk of childhood leukemia as much as seven-fold.¹⁶

- Studies show that children living in households where pesticides are used suffer elevated rates of leukemia, brain cancer and soft tissue sarcoma.¹⁷
- Pesticides can increase susceptibility to certain cancers by breaking down the immune system's surveillance against cancer cells. Infants and children, the aged and the chronically ill are at greatest risk from chemically-induced immune suppression.¹⁸
- A study published by the American Cancer Society finds an increased risk for non-Hodgkin's lymphoma (NHL) in people exposed to common herbicides and fungicides, particularly the weedkiller mecoprop (MCPP). People exposed to glyphosate (Roundup®) are 2.7 times more likely to develop NHL.¹⁹
- 75 out of all 99 human studies done on lymphoma and pesticides find a link between the two.²⁰
- Four peer-reviewed studies demonstrate the ability of glyphosate-containing herbicides to cause genetic damage to DNA (mutagenicity), even at very low concentration levels.²¹
- A 2007 study published in *Environmental Health Perspectives* finds that children born to mothers living in households with pesticide use during pregnancy had over twice as much risk of getting cancer, specifically acute leukemia (AL) or non-Hodgkin lymphoma (NHL).²²
- A 2007 Canadian report shows that a greater environmental risk exists for boys, specifically when it comes to cancer, asthma, learning and behavioral disorders, birth defects and testicular dysgenesis syndrome.²³

Children, asthma and pesticides

- Researchers find that pesticides may increase the risk of developing asthma, exacerbate a previous asthmatic condition or even trigger asthma attacks by increasing bronchial hyper-responsiveness.²⁴

- One 2015 farmworker study found an association between early-life exposure to OPs and respiratory symptoms consistent with possible asthma in childhood.²⁵
- A 2012 study concluded that prenatal PBO exposure was associated with childhood cough in inner city children.²⁶
- A 2004 study finds that young infants and toddlers exposed to herbicides (weedkillers) within their first year of life are 4.5 times more likely to develop asthma by the age of five, and almost 2.5 times more likely when exposed to insecticides.²⁷
- EPA material safety data sheets for the common herbicides 2,4-D, mecoprop, dicamba, (often combined as Trimec®) and glyphosate (Roundup®) list them as respiratory irritants that can cause irritation to skin and mucous membranes, chest burning, coughing, nausea and vomiting.

Children, learning and developmental disorders and pesticides

- Roughly one in six children in the U.S. has one or more developmental disability, ranging from a learning disability to a serious behavioral or emotional disorder.²⁸
- Scientists believe that the amount of toxic chemicals in the environment that cause developmental and neurological damage are contributing to the rise of physical and mental effects being found in children.²⁹
- According to researchers at the University of California-Berkeley School of Public Health, exposure to pesticides while in the womb may increase the odds that a child will have attention deficit hyperactivity disorder (ADHD).³⁰
- Studies show children's developing organs create "early windows of great vulnerability" during which exposure to pesticides can cause great damage.³¹
- Lawn pesticide products containing herbicides and fertilizers

(such as “weed and feed” products) tested on mice show increased risk of infertility, miscarriage and birth defects at very low dosages.³²

- Results from a CHARGE study finds that agricultural exposures to organophosphates at some point during gestation was associated with a 60% increased risk for autism higher for third-trimester exposures, and second-trimester chlorpyrifos applications. Similarly, children of mothers residing near pyrethroid insecticide applications just before conception or during third trimester were at greater risk for both autism and developmental delay.³³
- Researchers at the Cincinnati Children’s Hospital Medical Center found an association between increasing pyrethroid pesticide exposure and ADHD which they conclude may be stronger for symptoms seen in boys compared to girls.³⁴
- Additional studies on lawn pesticide product formulations show effects on learning ability, aggressiveness, memory, motor skills and immune system function.³⁵
- A 2002 study finds children born to parents exposed to glyphosate (Roundup®) show a higher incidence of attention deficit disorder and hyperactivity.³⁶
- A study of 210,723 live births in Minnesota farming communities finds children of pesticide applicators have significantly higher rates of birth defects than the average population.³⁷
- In a 2004-2005 review of 2,4-D, EPA finds that, “there is a concern for endocrine disruption.”³⁸
- Biomonitoring testing in Canada finds residues of lawn pesticides, such as 2,4-D and mecoprop, in 15 percent of children tested, ages three to seven, whose parents had recently applied the lawn chemicals. Breakdown products of organophosphate insecticides are present in 98.7 percent of children tested.⁴⁰
- Scientific studies show that 2,4-D applied to lawns drifts and is tracked indoors where it settles in dust, air and surfaces and may remain for up to a year in carpets.⁴¹
- One 2014 analysis of 129 preschool children, ages 20 to 66 months, found that children were exposed to indoor concentrations of pyrethroids, organophosphates and organochlorines pesticides which were detected in soil, dust and indoor air.⁴²
- Samples from 120 Cape Cod homes, where elevated incidence of breast, colorectal, lung, and prostate cancers are reported, find high indoor air and dust concentrations of carbaryl, permethrin, and 2,4-D.⁴³
- A study published in *Environmental Health Perspectives* found that children who eat a conventional diet of food produced with chemical-intensive practices carry residues of organophosphate pesticides that are reduced or eliminated when they switch to an organic diet.⁴⁴
- Scientists at the California Department of Public Health found that 28% of the mothers studied who lived near fields in the Central Valley, which were sprayed with organochlorines, such as endosulfan and dicofol, have children with autism.⁴⁵

Pesticide accumulation and drift

- Children ages 6-11 nationwide have significantly higher levels of pesticide residues in their bodies than all other age categories.³⁹
- A 2005 study published in the *Journal of the American Medical Association* found that students and school employees are being poisoned by pesticide use at schools and from drift off of neighboring farmlands.⁴⁶

Endnotes

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Endnotes, continued

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Memorandum

To: Parks and Public Landscape Advisory Board
From: Abby McNeal, Parks Superintendent
Date: 06/04/2025
Re: Parks Herbicide Safety Data Sheets (SDS)

As requested at the May PPLAB meeting you will find Safety Data Sheets (SDS) for the herbicides that Parks staff applied as outlined below in 2024 and 2024.

2023 Applications – Avenger - cobble beds, sidewalks downtown (60%), landscape beds, mulch rings.

Crew and Cool Power to Steel Ranch and Cowboy (ONLY) turfgrass and landscape bed

Snapshot- landscape perennial beds included where needed in medians

2024 Applications: Avenger cobble beds, sidewalks downtown (60%), landscape beds, mulch rings.

Cool Power-Athletic field outfields- Cleo Mudrock and Heritage, median rock beds, and downtown. Steele Ranch turfgrass areas.

Cheetah Pro downtown sidewalks, tree rings, rocks bed, landscape beds,

Snapshot (pre-emergent) all city managed landscape perennial and annual beds

2025 Applications: Avenger cobble beds, sidewalks downtown (60%), landscape beds, mulch rings.

Cheetah Pro downtown sidewalks, tree rings, rocks bed, landscape beds,

Snapshot (pre-emergent) all city managed landscape perennial and annual beds

All pesticide applications were performed by Certified Pesticide Applicators in full compliance with local, state, and federal regulations. Each application was made at the lowest labeled rate and targeted specific pests as intended.

Staff qualifications: 6 Qualified Supervisor Applicators- that include 108, 206, 207 endorsements



Material Safety Data Sheet
For Avenger® Weed Killer Concentrate Herbicide
Cutting Edge Formulations, Inc.
3057 Summer Oak Place
Buford, GA 30518
August, 2006

MATERIAL SAFETY DATA SHEET

For Avenger® Weed Killer Concentrate
(EPA Reg. No. 82052 – 1)

Emergency Phone Numbers:

Cutting Edge Formulations: (678) 546-5009
CHEMTREC 24 Hour Number (800) 424-9300

Section 1 – IDENTIFICATION

Product Name: Avenger® Weed Killer Concentrate

Section 2 – INGREDIENT INFORMATION

Avenger Weed Killer Concentrate consists of:

d-Limonene (technical grade): 74 to 78% (CAS Number: 5989-27-5)
Castor Oil: 1 to 4%
Emulsifiers: 18 to 23%

Section 3 – HEALTH HAZARDS IDENTIFICATION
--

Health Hazards: Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes, or clothing.

Signs and Symptoms of Exposure: Product may be irritating to the skin, eyes, nose and throat.

Medical Conditions Generally Aggravated by Exposure: Persons with allergies or pre-existing skin conditions should avoid contact with this product.

Emergency & First Aid Procedures :

Eyes: Remove contact lenses at once. Flush with water for at least 15 minutes.

Skin: Wash affected area with copious amounts of soap and water. If irritation develops, seek medical attention.

Ingestion: Seek medical attention immediately. Do not induce vomiting. Rinse mouth with water, then drink one glass of water. Do not leave victim unattended. Never give anything by mouth if victim is unconscious, is rapidly losing consciousness, or is convulsing.

Inhalation: If symptoms of overexposure are experienced, evacuate to fresh air.

If any symptoms persist, seek medical attention.

The toxicity parameters of the primary ingredient, d-Limonene, are as follows:

It is not acutely toxic.

Oral: LD50 >5 g/kg, rabbit

Dermal: LD50 >5 g/kg, rabbit

Skin: The skin irritancy of limonene in guinea pigs and rabbits is considered moderate and low, respectively.

Inhalation: LC50 >1000 ppm

Hazardous Materials Identification System - HMIS:

- 1 Health Hazard - Mild skin irritant
- 2 Flammability - Flashpoint 122° F (50°C), as determined by TAG Closed Cup
- 0 Reactivity - Stable
- G Protection - Safety glasses, gloves

This substance contains no materials subject to the reporting requirements of SARA TITLE III SECTION 313.

Chronic Toxicity: Not listed as a carcinogen (OSHA, NTP, IARC, or ACGIH)

Ecotoxicological Information: Product may be toxic to aquatic organisms.

Section 4 –PHYSICAL DATA

Appearance: Clear, colorless liquid

Odor: Orange or lemon-lime aroma

Specific Gravity: 0.854 g/ml (53.3 lb/ cu. ft.) at 68°F (20°C)

Flashpoint: 122°F (50°C), as determined by TAG Closed Cup

pH: aqueous mixture containing 1% v/v of Concentrate has a pH of 4.8 at 73°F (23°C)

Viscosity: 1.50 at 23°C

Section 5 – FIRE AND EXPLOSION HAZARD DATA

Flash Point: 126°F (52°C)

Extinguishing Media: Carbon dioxide, foam or dry chemical

Special Fire Fighting Procedures: SCBA recommended. Smother to exclude air. Do not use water. Handle as an oil fire.

Unusual Fire and Explosive Hazards: Combustible liquid. Keep away from heat, sparks, and open flame.

Hazardous Decomposition Materials: Smoke may be acrid and the fumes may be irritating. Burning generates CO, CO₂, and smoke.

Conditions to Avoid for Stability: Avoid temperatures over 122° F (50°C)

Section 6 – SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Released or Spilled: Use protective gloves to avoid skin contact. Small spills can be wiped up. Large spills should be absorbed by dirt, sand, or other suitable absorbents for disposal.

Section 7 –SPECIAL PROTECTION INFORMATION
--

Eye Protection: Safety goggles or glasses suggested.

Skin Protection: Oil resistant gloves.

Appropriate Hygienic Practices: Wash thoroughly after handling. Launder contaminated clothing before re-use.

Section 8 – SPECIAL PRECAUTIONS
--

Precautions to be Taken in Handling and Storing: Usual precautions for combustible liquids.

Section 9 – REGULATORY INFORMATION

Registration for use as a herbicide has been approved at the U.S. Environmental Protection Agency (EPA). EPA Registration No. 82052 – 1

Section 10 – TRANSPORTATION INFORMATION

TDG Status: Hazardous DOT Label/Placard [exemption § 173.150(f) applies:
IMO Status: Hazardous Highway/Rail: per requirements for Combustible Liquids
IATA Status: Hazardous Air/Ship: per requirements for Flammable Liquids

SHIPPING CLASSIFICATION:

Proper Shipping Name: TERPENE HYDROCARBONS, N.O.S.

Hazard Class: 3

Identification No.: UN2319

Packing Group: III

The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

Section 11 – ADDITIONAL INFORMATION

National Fire Protection Association Hazard Ratings - NFPA(R):

- 1 Health Hazard - Slight
- 2 Flammability - Moderate
- 0 Reactivity - Minimal

Key Legend Information:

ACGIH American Conference of Governmental Industrial Hygienists

OSHA Occupational Safety and Health Administration

NTP National Toxicology Program

IARC International Agency for Research on Cancer 4

The information contained herein is based on current knowledge and experience: no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information obtained by the user. No warranty is expressed or implied regarding the accuracy of this data, the results to be obtained from the use thereof, or that any such use will not infringe any patent. Users should make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials, the safety and health of employees and customers, and the protection of the environment. This information is furnished upon the condition the person receiving it shall determine the suitability for the particular purpose. This MSDS is to be used as a guideline for safe work practices and emergency response.



Cutting Edge Formulations, Inc.
3057 Summer Oak Place
Buford, GA 30518
August, 2006

**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

Product Name: Cheetah® Pro
EPA Reg. No.: 228-743
Product Type: Herbicide
Company Name: Nufarm Americas Inc
11901 S. Austin Avenue
Alsip, IL 60803
1-855-280-6609

Telephone Numbers: For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,
Call CHEMTREC Day or Night: 1-800-424-9300
For Medical Emergencies Only, Call 1-877-325-1840

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not the same as the FIFRA label. Certain sections of this SDS are superseded by federal law governed by EPA for a registered pesticide. Please see Section 15. REGULATORY INFORMATION for explanation.

2. HAZARDS IDENTIFICATION**PHYSICAL HAZARDS:**

Flammable liquid

Category 4

HEALTH HAZARDS:

Acute Inhalation Toxicity

Category 3

Eye Damage / Irritation

Category 2B

Sensitization- Skin

Category 1

Specific Target Organ Toxicity – Repeat Exposure

Category 2

ENVIRONMENTAL HAZARDS:

Not hazardous

SIGNAL WORD:

DANGER

HAZARD STATEMENTS:

Combustible liquid. Toxic if inhaled. May cause damage to organs through prolonged or repeated exposure.
Causes eye irritation. May cause an allergic skin reaction.

**PRECAUTIONARY STATEMENTS**

Keep away from flames and hot surfaces- No smoking. Do not breath mist / vapors / spray. Use only outdoors or in a well-ventilated area. Wash hands thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves.

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center / doctor if you are exposed and feel unwell.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

IF ON SKIN: Wash with plenty of water. If skin irritation or rash occurs: Get medical attention. Wash contaminated clothing before reuse.

Get medical attention if you feel unwell.

Store in a well-ventilated place. Keep container tightly closed. Store locked up.

SAFETY DATA SHEET

Cheetah® Pro

Dispose of contents in accordance with local, state, and federal regulations or as instructed on product label.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NO.	% BY WEIGHT
Glufosinate-ammonium	77182-82-2	24.6 – 26.1
Other Ingredients	Proprietary*	Trade Secret

Synonyms: mixture containing 2-amino-4-(hydroxymethylphosphinyl)butanoic acid monoammonium salt

*Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

4. FIRST AID MEASURES

If on Skin or Clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water. Call a poison control center or doctor for treatment advice.

If Inhaled: Move person to fresh air. Call a poison control center or doctor for treatment advice.

If Swallowed: Call a poison control center or doctor for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center 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 several minutes. Remove contact lenses, if present, then continue rinsing eye. Call a poison control center or doctor for treatment advice if irritation occurs and persists.

Most Important symptoms/effects, acute and delayed: Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Inhalation can cause nausea, vomiting, and diarrhea. Skin exposure may cause slight irritation.

Indication of Immediate medical attention and special treatment if needed: Glufosinate-ammonium is a glutamine synthetase inhibitor and can interfere with neurotransmitter function. Symptoms may be delayed by up to 48 hours following ingestion. There is no specific antidote. If ingested, endotracheal intubation and gastric lavage should be performed as soon as possible followed by charcoal and sodium sulfate administration.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.

Special Fire Fighting Procedures: Firefighters should wear NIOSH approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazards: Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source, is a potential dust explosion hazard. If dry, sweep or scoop up material and place into container for disposal. If wet, pump any free liquid into an appropriate closed container. If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later. Decontaminate tools and equipment following cleanup.

Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as oxides of carbon and nitrogen.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.

Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.

Methods for Cleanup and Disposal: Avoid creation of dusty conditions. If dry, sweep or scoop up material and place into container for disposal. If wet, pump any free liquid into an appropriate closed container. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Handling:

Do not get in eyes, on skin or on clothing. Avoid breathing spray mist. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing/Personal Protective Equipment (PPE) immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and water. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Storage:

Do not use or store near heat or open flame. Keep the container tightly closed and dry in a cool, well-ventilated place. Storage temperature should not exceed 125° F. If storage temperature of this product is below 32° F, the material should not be pumped until its temperature exceeds 32° F. Protect against direct sunlight. Do not contaminate water, food, feed, or seed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:

Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:

Eye/Face Protection: To avoid contact with eyes, wear chemical goggles or shielded safety glasses or faceshield. An emergency eyewash or water supply should be readily accessible to the work area.

Skin Protection: To avoid contact with skin wear coveralls worn over short-sleeved shirt and short pants, chemical resistant footwear plus socks, chemical resistant gloves made of any waterproof material such as barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, polyvinyl chloride (PVC) ≥ 14 mils, or viton ≥ 14 mils. When mixing, loading, or cleaning equipment a chemical resistant apron must be worn. An emergency shower or water supply should be readily accessible to the work area.

Respiratory Protection: Not normally required. If dusts exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides. Mixers/loaders supporting aerial applications must wear a dust/mist filtering respirator (NIOSH approval number prefix TC-21C), or a NIOSH approved respirator with any N, R, P or HE filter.

General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
Glufosinate-ammonium	NE	NE	NE	NE	
Trade Secret	NE	NE	50	100	ppm
Other Ingredients	NE	NE	NE	NE	

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Transparent yellow liquid
Odor:	Mild sweet
Odor threshold:	No data available
pH:	8.0 (1% w/w dispersion in DIW)
Melting point/freezing point:	No data available
Initial boiling point and boiling range	No data available
Flash point:	145°F (63°C)
Evaporation rate:	No data available
Flammability (solid, gas):	No data available
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available

SAFETY DATA SHEET

Cheetah® Pro

Relative density: 1.085 g/cm³ at 26°C
Solubility(ies): No data available
Partition coefficient: n-octanol/water: No data available
Autoignition temperature: No data available
Decomposition temperature: No data available
Viscosity: 17.5 cps (26°C); 10.4 cps (39°C) capillary method

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Reactivity: Not reactive.

Chemical Stability: This material is stable under normal handling and storage conditions.

Possibility of Hazardous Reactions: Will not occur.

Conditions to Avoid: Keep away from heat, sparks and open flame. Minimize dust generate and accumulation.

Incompatible Materials: Strong oxidizing agents; bases and acids.

Hazardous Decomposition Products: May produce gases such as oxides of carbon and nitrogen.

11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Eye contact, Skin contact

Symptoms of Exposure:

Eye Contact: Moderately irritating.

Skin Contact: May cause skin irritation. Harmful if absorbed through skin. May cause symptoms similar to ingestion.

Ingestion: Harmful if swallowed. Ingestion may cause irritation of the digestive tract with stomach pain, heartburn, nausea, vomiting or diarrhea.

Inhalation: May cause irritation.

Delayed, immediate and chronic effects of exposure: Skin, eye and/or respiratory irritation.

Toxicological Data:

Data from laboratory studies conducted on this product:

Oral: Rat LD₅₀: 3129 mg/kg

Dermal: Rat LD₅₀: > 2,000 to < 5,000 mg/kg

Inhalation: Rat 4-hr LC₅₀: > 0.55 to < 2.15 mg/L

Eye Irritation: Rabbit: Moderately irritating (MMTS=26.7)

Skin Irritation: Rabbit: Slightly irritating (PDII= 1.3)

Skin Sensitization: Tested positive for sensitization (LLNA).

Subchronic Toxicity: Glufosinate-ammonium was well tolerated in the rat but less well tolerated in the dog in subchronic studies. Glufosinate-ammonium has demonstrated effects on the central nervous system at high dose levels in standard toxicity studies using laboratory animals.

Reproductive Toxicity: Implantation loss occurred at high dose levels in a rat multigeneration study with glufosinate-ammonium. There were no effects on male fertility.

Developmental Toxicity: Tests in the rat and rabbit indicate that exposure to high dose levels of glufosinate-ammonium may result in embryotoxicity.

Mutagenicity and Genotoxicity: Glufosinate-ammonium was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.

Assessment Carcinogenicity:

This product contains substances that are considered to be probable or suspected human carcinogens as follows:

Component	Regulatory Agency Listing As Carcinogen			
	ACGIH	IARC	NTP	OSHA
Glufosinate-ammonium	No	No	No	No
Other Ingredients (TRADE SECRET)	No	No	No	No

12. ECOLOGICAL INFORMATION

Ecotoxicity:**Data on Glufosinate-Ammonium Technical:**

96-hr LC ₅₀ Rainbow Trout:	>320 mg/L	Acute LD ₅₀ Bobwhite Quail	> 2000 mg/L
48-hr EC ₅₀ , Daphnia Magna	668 mg/L	Acute LD ₅₀ Mallard Duck	> 2000 mg/L
48-hr LD ₅₀ , Honeybees	354 µg/L		

Environmental Fate:

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Do not allow to get into surface water, drains and ground water. Drift or runoff from treated areas may adversely affect non-target plants. Apply this product as specified on the label. Do not apply when weather conditions favor runoff or drift.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Pesticide wastes are toxic. Wastes resulting from the use of this product may be disposed of on-site or at an approved waste disposal facility.

Container Handling and Disposal:

Non-refillable Containers 5 Gallons or Less: Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Non-refillable containers larger than 5 gallons: Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this SDS.

DOT:

≥ 119 gallons per completed package

NA1993, COMBUSTIBLE LIQUID, N.O.S., 3, III

IMDG

Not Regulated

IATA

Not Regulated

15. REGULATORY INFORMATION**EPA FIFRA INFORMATION**

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

CAUTION. Harmful if absorbed through skin, swallowed or inhaled. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing and breathing vapor. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

U.S. FEDERAL REGULATIONS

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):

Acute Health, Chronic Health

Section 313 Toxic Chemical(s):

None

Reportable Quantity (RQ) under U.S. CERCLA:

None

RCRA Waste Code:

Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

State Information: Other state regulations may apply. Check individual state requirements.

California Proposition 65: None listed.

16. OTHER INFORMATION**National Fire Protection Association (NFPA) Hazard Rating:**

Rating for this product: Health: 2 Flammability: 1 Reactivity: 0

Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This SDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

SAFETY DATA SHEET

Cheetah® Pro

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED.

Date of Issue: October 2, 2018

Supersedes:

NEW



For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,
Call CHEMTREC Day or Night: 1-800-424-9300.
For Medical Emergencies Only, Call 1-877-325-1840.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Cool Power[®] Selective Herbicide
Synonyms: Herbicide Mixture of MCPA, Triclopyr and Dicamba
EPA Reg. No.: 228-317

Company Name: Nufarm Americas Inc.
150 Harvester Drive, Suite 200
Burr Ridge, IL 60527

Date of Issue: March 16, 2007
Sections Revised: 2, 3, 4, 7, 12 and 14

Supersedes: July 13, 2006

2. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance and Odor: Amber colored liquid with typical fatty ester odor.

Warning Statements: Keep out of reach of children. CAUTION. Causes moderate eye irritation. Harmful if swallowed or absorbed through skin. Avoid contact with skin, eyes or clothing.

Potential Health Effects:

Likely Routes of Exposure: Inhalation, eye and skin contact.

Eye Contact: Causes moderate eye irritation. Vapors and mist may cause irritation.

Skin Contact: Moderately irritating. Overexposure by skin absorption may cause symptoms similar to those for ingestion.

Ingestion: Harmful if swallowed. May cause nausea, vomiting, abdominal pain, decreased blood pressure, muscle weakness, muscle spasms. The petroleum hydrocarbon component, if aspirated into the respiratory system during ingestion or vomiting, may cause mild or severe pulmonary injury, possibly progressing to death.

Inhalation: Low inhalation toxicity. May irritate the respiratory tract or cause dizziness. Overexposure to petroleum hydrocarbon component may cause irritation to respiratory tract, headaches, anaesthesia, drowsiness, unconsciousness and other central nervous system effects, possibly including death.

Medical Conditions Aggravated by Exposure: Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

Potential Environmental Effects:

Drift or runoff may adversely affect non-target plants.

See Section 12: ECOLOGICAL INFORMATION for more information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
2-methyl-4-chlorophenoxyacetic acid, isooctyl (2-ethylhexyl) ester	29450-45-1	56.14
Butoxyethanol Ester 3,5,6-Trichloro-2-Pyridinyloxyacetic Acid	64700-56-7	5.00
Dicamba Acid	1918-00-9	3.60

MATERIAL SAFETY DATA SHEET**Cool Power Selective Herbicide**

Other Ingredients Including:
Petroleum distillates

35.26
64742-47-8

4. FIRST AID MEASURES

If in Eyes: Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

If Swallowed: Call a poison control center 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 the poison control center or doctor. Do not give anything by mouth to an unconscious person.

If on Skin: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center 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 center or doctor for further treatment advice.

Note to Physician: Contains petroleum distillates. May pose an aspiration pneumonia hazard.

5. FIRE FIGHTING MEASURES

Flash Point: >200°F (93°C) Tag Closed Cup

Autoignition Temperature: Not determined

Flammability Limits: Not determined

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.

Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazards: If water is used to fight fire or cool containers, dike to prevent runoff contamination of municipal sewers and waterways.

Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as hydrogen chloride and oxides of nitrogen and carbon.

National Fire Protection Association (NFPA) Hazard Rating:

Rating for this product: Health: 2 Flammability: 1 Reactivity: 0

Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.

Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.

Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Handling:

Avoid contact with skin, eyes or clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove Personal Protective 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. Do not enter or allow other to enter the treated area until sprays have dried.

Storage:

Use original container to store pesticides in a secured warehouse or storage building. Place in an area inaccessible to children. Containers should be opened in well-ventilated area. Keep container tightly sealed when not in use. Do not stack cardboard cases more than two pallets high. Do not store near open containers of fertilizer, seed or other pesticides. Do not contaminate water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:

Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:

Eye/Face Protection: To avoid contact with eyes, wear chemical goggles or shielded safety glasses. An emergency eyewash or water supply should be readily accessible to the work area.

Skin Protection: To avoid contact with skin, wear long pants, long-sleeved shirt, socks, shoes and chemical-resistant gloves. An emergency shower or water supply should be readily accessible to the work area.

Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.

General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
MCPA 2EHE	NE	NE	NE	NE	
Triclopyr BEE	NE	NE	NE	NE	
Dicamba	NE	NE	NE	NE	

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Amber colored liquid with typical fatty ester odor.

Boiling Point: Not determined
Density: 8.5 pounds/gallon
Evaporation Rate: Not determined
Freezing Point: Not determined
pH: Not determined

Solubility in Water: Emulsifiable
Specific Gravity: 1.027 @ 20°C
Vapor Density: Not determined
Vapor Pressure: Not determined
Viscosity: 26.0 cps @ 25°C

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Chemical Stability: This material is stable under normal handling and storage conditions.

Conditions to Avoid: Excessive heat. Do not store near heat or flame.

Incompatible Materials: Strong oxidizing agents: bases and acids.

Hazardous Decomposition Products: Under fire conditions may produce gases such as hydrogen chloride and oxides of nitrogen and carbon.

Hazardous Reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Data from laboratory studies on this product are summarized below:

Oral: Rat LD₅₀: 1,000 mg/kg (female) and 1,231 mg/kg (male)

Dermal: Rabbit LD₅₀: 3,535 mg/kg (female) and 3,969 mg/kg (male)

Inhalation: Rat 4-hr LC₅₀: >3.59 mg/l (maximum attainable concentration)

Eye Irritation: Rabbit: Mildly irritating

Skin Irritation: Rabbit: Moderately irritating

Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Subchronic (Target Organ) Effects: Repeated overexposure to phenoxy herbicides may cause effects to liver, kidneys, blood chemistry, and gross motor function. Rare cases of peripheral nerve damage have been reported, but extensive animal studies have failed to substantiate these observations, even at high doses for prolonged periods. Excessive exposure to Triclopyr may cause liver or kidney effects. Repeated overexposure to dicamba may cause liver changes or a decrease in body weight.

Carcinogenicity / Chronic Health Effects: The International Agency for Research on Cancer (IARC) lists exposure to chlorophenoxy herbicides as a class 2B carcinogen, the category for limited evidence for carcinogenicity in humans. However, newer rat and mouse lifetime feeding studies did not show carcinogenic potential for MCPA. Triclopyr did not cause cancer in laboratory studies. Dicamba did not cause cancer in long-term animals studies. The U.S. EPA has given triclopyr and dicamba a Class D classification (not classifiable as to human carcinogenicity).

Reproductive Toxicity: MCPA studies in laboratory animals have shown testicular effects and lower male fertility. For triclopyr, in laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. Dicamba did not interfere with fertility in reproduction studies in laboratory animals.

Developmental Toxicity: MCPA studies in laboratory animals have shown decreased fetal body weights and delayed development in the offspring at doses toxic to mother animals. For triclopyr, birth defects are unlikely. Even exposures having an adverse effect on the mother should have no effect on the fetus. Animal tests with dicamba have not demonstrated developmental effects.

Genotoxicity: There have been some positive and some negative studies, but the weight of evidence is that MCPA is not mutagenic. Animal tests with triclopyr did not demonstrate mutagenic effects. Animal tests with dicamba did not demonstrate mutagenic effects.

Assessment Carcinogenicity:

This product contains substances that are considered to be probable or suspected human carcinogens as follows:

Component	Regulatory Agency Listing As Carcinogen			
	ACGIH	IARC	NTP	OSHA
Chlorophenoxy Herbicides	No	2B	No	No

See Section 2: HAZARDS IDENTIFICATION for more information.

12. ECOLOGICAL INFORMATION**Ecotoxicity:****Data on MCPA 2EHE:**

96-hour LC ₅₀ Bluegill:	3.9 ± 0.7 mg/l	Bobwhite Quail Dietary LC ₅₀ :	>5,620 ppm
96-hour LC ₅₀ Rainbow Trout:	3.2 mg/l	Mallard Duck 8-day Dietary LC ₅₀ :	>5,620 ppm
48-hour EC ₅₀ Daphnia:	0.28 mg/l		

Data on Triclopyr BEE:

96-hour LC ₅₀ Bluegill:	0.36 mg/l	Bobwhite Quail Oral LD ₅₀ :	735 mg/kg
96-hour LC ₅₀ Rainbow Trout:	0.65 mg/l	Bobwhite Quail 8-day Dietary LC ₅₀ :	5,401 ppm
48-hour EC ₅₀ Daphnia:	10.1 mg/l	Mallard Duck 8-day Dietary LC ₅₀ :	>5,401 ppm

Data on Dicamba:

96-hour LC ₅₀ Bluegill:	135 mg/l	Bobwhite Quail 8-day Dietary LC ₅₀ :	>10,000 ppm
96-hour LC ₅₀ Rainbow Trout:	135 mg/l	Mallard Duck 8-day Dietary LC ₅₀ :	>10,000 ppm
48-hour EC ₅₀ Daphnia:	110 mg/l		

Environmental Fate:

MCPA 2EHE is rapidly de-esterified to parent MCPA acid in the environment. In soil, MCPA is microbially degraded with a typical half-life of approximately 10 to 14 days. In laboratory and field studies, Triclopyr BEE hydrolyzes to parent acid in the environment. Triclopyr is moderately persistent and mobile. In soil, the predominant degradation pathway is microbial and the average half-life is 30 days. Half-lives tend to be shorter in warm, moist soils with a high organic content. The predominant degradation pathway for triclopyr in water is photodegradation and the average half-life is one day. Initially, triclopyr BEE may bind to suspended organic particles or sediments in the water and while bound effectively lengthen the half-life in water. Dicamba has low bioaccumulation potential, is not persistent in soil, is highly mobile in soil and degrades rapidly.

13. DISPOSAL CONSIDERATIONS**Residential:**

If empty – Do not reuse this container. Place in trash or offer for recycling if available. **If partly filled** – If product cannot be used as directed, call your local solid waste agency or 1-800-CLEANUP for disposal instructions. Never place unused product down any indoor (including toilet) or outdoor (including sewer) drain.

Commercial:

Pesticide Disposal: If container is damaged or if pesticide has leaked, contain all spillage. Absorb and clean up all spilled material with granules or sand. Place in a closed labeled container for proper disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities by burning. If burned, stay out of smoke.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

DOT

< 3,228 gallons per completed package

Non Regulated – See 49 CFR 173.132(b)(3) & 172.101 Appendix A

≥ 3,228 gallons per completed package

RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (DICAMBA), 9, UN 3082, III

See 49 CFR 172.101 Appendix A

IMDG

Non Regulated – See IMDG 2.6.2.1.3

IATA

Non Regulated – See IATA 3.6.1.5.3

15. REGULATORY INFORMATION**U.S. Federal Regulations:**

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):

Immediate and Delayed

Section 313 Toxic Chemical(s):

Dicamba (CAS No. 1918-00-9), 3.60% by weight in product

Reportable Quantity (RQ) under U.S. CERCLA:

Dicamba (CAS No. 1918-00-9) 1,000 pounds

RCRA Waste Code:

None

State Information:

Other state regulations may apply. Check individual state requirements.

California Proposition 65: Not Listed

16. OTHER INFORMATION

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

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MATERIAL SAFETY DATA SHEET

Cool Power Selective Herbicide

EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

Cool Power is a registered trademark of Nufarm Americas Inc.

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Crew™

Version 1.0	Revision Date: 04/29/2022	SDS Number: 800080005804	Date of last issue: - Date of first issue: 04/29/2022
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Corteva Agriscience™ encourages you and expects you to read and understand the entire SDS as there is important information throughout the document. This SDS provides users with information relating to the protection of human health and safety at the workplace, protection of the environment and supports emergency response. Product users and applicators should primarily refer to the product label attached to or accompanying the product container. This Safety Data Sheet adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. IDENTIFICATION

Product name : Crew™

Manufacturer or supplier's details

COMPANY IDENTIFICATION

Manufacturer/importer : CORTEVA AGRISCIENCE LLC
9330 ZIONSVILLE RD
INDIANAPOLIS, IN, 46268-1053
UNITED STATES

Customer Information Number : 800-992-5994

E-mail address : customerinformation@corteva.com

Emergency telephone : INFOTRAC (CONTRACT 84224).
800-992-5994 or 317-337-6009

Recommended use of the chemical and restrictions on use

Recommended use : End use herbicide product

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Carcinogenicity : Category 1A

GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H350 May cause cancer.

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Precautionary Statements :

Prevention:
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Storage:
P405 Store locked up.

Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
isoxaben (ISO)	82558-50-7	0.5
Dithiopyr	97886-45-8	0.25
Silica, crystalline (quartz)	14808-60-7	>= 3 - < 10
Balance	Not Assigned	> 80

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

If inhaled : Move person to fresh air; if effects occur, consult a physician.
In case of skin contact : Wash off with plenty of water.
In case of eye contact : Flush eyes with plenty of water; remove contact lenses after the first 1-2 minutes then continue flushing for several minutes. Only mechanical effects expected. If effects occur, consult a physician, preferably an ophthalmologist.

If swallowed : No emergency medical treatment necessary.
Most important symptoms and effects, both acute and delayed : None known.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection).
If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Notes to physician : No specific antidote.

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Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5. FIRE-FIGHTING MEASURES

- | | |
|--|---|
| Suitable extinguishing media | : Water spray
Alcohol-resistant foam |
| Unsuitable extinguishing media | : None known. |
| Specific hazards during fire fighting | : Exposure to combustion products may be a hazard to health. Do not allow run-off from fire fighting to enter drains or water courses. |
| Hazardous combustion products | : During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. |
| Specific extinguishing methods | : Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Use water spray to cool unopened containers. |
| Further information | : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. |
| Special protective equipment for fire-fighters | : Wear self-contained breathing apparatus for firefighting if necessary.
Use personal protective equipment. |

SECTION 6. ACCIDENTAL RELEASE MEASURES

- | | |
|---|--|
| Personal precautions, protective equipment and emergency procedures | : Avoid dust formation.
Avoid breathing dust.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. |
| Environmental precautions | : If the product contaminates rivers and lakes or drains inform respective authorities.
Discharge into the environment must be avoided.
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.
Prevent from entering into soil, ditches, sewers, underwater.
See Section 12, Ecological Information. |
| Methods and materials for containment and cleaning up | : Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in.
Pick up and arrange disposal without creating dust.
Recovered material should be stored in a vented container. |

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The vent must prevent the ingress of water as further reaction with spilled materials can take place which could lead to over-pressurization of the container.
Keep in suitable, closed containers for disposal.
Sweep up or vacuum up spillage and collect in suitable container for disposal.
See Section 13, Disposal Considerations, for additional information.

SECTION 7. HANDLING AND STORAGE

- Local/Total ventilation : Use with local exhaust ventilation.
Advice on safe handling : Do not breathe vapors/dust.
Do not smoke.
Handle in accordance with good industrial hygiene and safety practice.
Avoid exposure - obtain special instructions before use.
Smoking, eating and drinking should be prohibited in the application area.
Do not get on skin or clothing.
Avoid inhalation of vapor or mist.
Avoid contact with skin and eyes.
Keep container tightly closed.
Take care to prevent spills, waste and minimize release to the environment.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
- Conditions for safe storage : Store in a closed container.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep in properly labeled containers.
Store in accordance with the particular national regulations.
- Materials to avoid : Do not store near acids.
Strong oxidizing agents
Organic peroxides
Explosives
Gases
- Packaging material : Unsuitable material: None known.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Silica, crystalline (quartz)	14808-60-7	TWA (Respirable dust)	0.05 mg/m3	OSHA Z-1
		TWA (respirable)	10 mg/m3 / %SiO2+2	OSHA Z-3
		TWA (respirable)	250 mppcf / %SiO2+5	OSHA Z-3

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		TWA (Respirable particulate matter)	0.025 mg/m3 (Silica)	ACGIH
		TWA (respirable dust fraction)	0.1 mg/m3	OSHA P0
		PEL (respirable)	0.05 mg/m3	OSHA CARC

Engineering measures : Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Personal protective equipment

Respiratory protection : Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In dusty or misty atmospheres, use an approved particulate respirator.

Hand protection

Remarks : Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized.

Eye protection : Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles.

Skin and body protection : No precautions other than clean body-covering clothing should be needed.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : granules

Color : Gray

Odor : Faint

Odor Threshold : No data available

pH : 4.33

Freezing point : Not applicable

Melting point/range : No data available

Boiling point/boiling range : Not applicable

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Flash point	: Not applicable
Evaporation rate	: Not applicable
Flammability (solid, gas)	: No data available
Upper explosion limit / Upper flammability limit	: Not applicable
Lower explosion limit / Lower flammability limit	: Not applicable
Vapor pressure	: Not applicable
Relative vapor density	: Not applicable
Relative density	: 2.2
Bulk density	: No data available
Solubility(ies) Water solubility	: insoluble
Autoignition temperature	: No data available
Viscosity Viscosity, dynamic	: Not applicable
Explosive properties	: No data available
Oxidizing properties	: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Not classified as a reactivity hazard.
Chemical stability	: No decomposition if stored and applied as directed. Stable under normal conditions.
Possibility of hazardous reactions	: Stable under recommended storage conditions. No hazards to be specially mentioned. None known.
Conditions to avoid	: None known.
Incompatible materials	: None.
Hazardous decomposition products	: Decomposition products depend upon temperature, air supply and the presence of other materials.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	: LD50 (Rat): 22,500 mg/kg
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Components:

isoxaben (ISO):

- Acute oral toxicity : LD50 (Rat, male and female): > 5,000 mg/kg
- Acute inhalation toxicity : Remarks: Prolonged excessive exposure to dust may cause adverse effects.
Based on the available data, narcotic effects were not observed.
Based on the available data, respiratory irritation was not observed.
- LC50 (Rat, male and female): > 2.93 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity
- Symptoms: No deaths occurred at this concentration.
Remarks: Maximum attainable concentration.
- Acute dermal toxicity : LD50 (Rabbit, male and female): > 2,000 mg/kg
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute dermal toxicity

Dithiopyr:

- Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Symptoms: No deaths occurred at this concentration.
- Acute inhalation toxicity : Remarks: No adverse effects are anticipated from inhalation.
Based on the available data, narcotic effects were not observed.
Based on the available data, respiratory irritation was not observed.
- LC50 (Rat): > 5.98 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Symptoms: No deaths occurred at this concentration.
- Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg
Symptoms: No deaths occurred at this concentration.

Skin corrosion/irritation

Product:

- Remarks : May cause skin irritation due to mechanical abrasion.

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Components:

Silica, crystalline (quartz):

Result : No skin irritation

Serious eye damage/eye irritation

Product:

Remarks : Solid or dust may cause irritation or corneal injury due to mechanical action.

Components:

Silica, crystalline (quartz):

Result : No eye irritation

Respiratory or skin sensitization

Components:

Isoxaben (ISO):

Remarks : Did not cause allergic skin reactions when tested in guinea pigs.

Remarks : For respiratory sensitization:
No relevant data found.

Dithiopyr:

Remarks : Did not cause allergic skin reactions when tested in guinea pigs.

Remarks : For respiratory sensitization:
No relevant data found.

Germ cell mutagenicity

Components:

isoxaben (ISO):

Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative., Animal genetic toxicity studies were predominantly negative.

Dithiopyr:

Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative., Animal genetic toxicity studies were negative.

Silica, crystalline (quartz):

Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative in some cases and positive in other cases.

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Carcinogenicity

Product:

Carcinogenicity - Assessment : Human carcinogen.

Components:

Isoxaben (ISO):

Carcinogenicity - Assessment : An increase in nonmalignant liver tumors was observed with isoxaben in one of two species tested.

Dithiopyr:

Carcinogenicity - Assessment : Did not cause cancer in laboratory animals.

Silica, crystalline (quartz):

Carcinogenicity - Assessment : Human carcinogen.
Has caused cancer in humans., Has caused cancer in laboratory animals.

IARC	Group 1: Carcinogenic to humans Silica, crystalline (quartz) (Silica dust, crystalline)	14808-60-7
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OSHA	OSHA specifically regulated carcinogen Silica, crystalline (quartz) (crystalline silica)	14808-60-7
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NTP	Known to be human carcinogen Silica, crystalline (quartz) (Silica, Crystalline (Respirable Size))	14808-60-7
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Reproductive toxicity

Components:

Isoxaben (ISO):

Reproductive toxicity - Assessment : In animal studies, has been shown to interfere with reproduction in females., Effects have been seen only at doses that produced significant toxicity to the parent animals.
Has caused birth defects in laboratory animals only at doses toxic to the mother.

Dithiopyr:

Reproductive toxicity - Assessment : For similar material(s);, In animal studies, did not interfere with reproduction.
For similar material(s);, Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

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Silica, crystalline (quartz):

Reproductive toxicity - Assessment : For similar material(s), Did not cause birth defects or any other fetal effects in laboratory animals.

STOT-single exposure

Product:

Assessment : Available data are inadequate to determine single exposure specific target organ toxicity.

Components:

Isoxaben (ISO):

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Silica, crystalline (quartz):

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT-repeated exposure

Components:

Silica, crystalline (quartz):

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

isoxaben (ISO):

Remarks : In animals, effects have been reported on the following organs:
Liver.
Kidney.

Dithiopyr:

Remarks : For similar material(s):
In animals, effects have been reported on the following organs:
Liver.
Kidney.
Adrenal gland.
Thyroid.
Gall bladder.
Blood.

Silica, crystalline (quartz):

Remarks : In humans, effects have been reported on the following or-

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gans:
Kidney.
Repeated excessive exposure to crystalline silica may cause silicosis, a progressive and disabling disease of the lungs.

Aspiration toxicity

Components:

isoxaben (ISO):

Based on physical properties, not likely to be an aspiration hazard.

Dithiopyr:

Based on available information, aspiration hazard could not be determined.

Silica, crystalline (quartz):

Based on physical properties, not likely to be an aspiration hazard.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

isoxaben (ISO):

Toxicity to fish : Remarks: Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

LC50 (Oncorhynchus mykiss (rainbow trout)): 1.2 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203 or Equivalent
Remarks: The LC50 value is above the water solubility.

LC50 (Cyprinodon variegatus (sheepshead minnow)): > 0.87 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203 or Equivalent
Remarks: The LC50 value is above the water solubility.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1.3 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202 or Equivalent

Toxicity to algae/aquatic plants : EbC50 (Lemna minor (duckweed)): 0.011 mg/l
End point: Biomass
Exposure time: 7 d
Test Type: static test
Method: OECD Test Guideline 201 or Equivalent

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ErC50 (*Pseudokirchneriella subcapitata* (green algae)): > 1.2 mg/l
End point: Growth rate inhibition
Exposure time: 72 h
Test Type: static test

ErC50 (*Skeletonema costatum* (marine diatom)): > 0.49 mg/l
Exposure time: 72 h
Test Type: static test

M-Factor (Acute aquatic toxicity) : 10

Toxicity to fish (Chronic toxicity) : NOEC (*Pimephales promelas* (fathead minnow)): 0.4 mg/l
End point: growth
Exposure time: 33 d
Test Type: semi-static test

LOEC (*Pimephales promelas* (fathead minnow)): > 0.40 mg/l
End point: growth
Exposure time: 33 d
Test Type: semi-static test

MATC (Maximum Acceptable Toxicant Level) (*Pimephales promelas* (fathead minnow)): > 0.40 mg/l
End point: growth
Exposure time: 33 d
Test Type: semi-static test

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (*Daphnia magna* (Water flea)): 0.69 mg/l
End point: growth
Exposure time: 21 d
Test Type: static test
Method: OECD Test Guideline 211 or Equivalent

LOEC (*Daphnia magna* (Water flea)): 1.01 mg/l
End point: growth
Exposure time: 21 d
Test Type: static test
Method: OECD Test Guideline 211 or Equivalent

MATC (Maximum Acceptable Toxicant Level) (*Daphnia magna* (Water flea)): 0.85 mg/l
End point: growth
Exposure time: 21 d
Test Type: static test
Method: OECD Test Guideline 211 or Equivalent

NOEC (saltwater mysid *Mysidopsis bahia*): 0.841 mg/l
Exposure time: 28 d
Test Type: flow-through test

LOEC (saltwater mysid *Mysidopsis bahia*): > 0.841 mg/l
Exposure time: 28 d
Test Type: flow-through test

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NOEC (Midge (*Chironomus riparius*)): 32 mg/l
End point: mortality
Exposure time: 28 d
Test Type: static test
Method: OECD Test Guideline 211 or Equivalent

LOEC (Midge (*Chironomus riparius*)): 64 mg/l
End point: mortality
Exposure time: 28 d
Test Type: static test
Method: OECD Test Guideline 211 or Equivalent

MATC (Maximum Acceptable Toxicant Level) (Midge (*Chironomus riparius*)): 48 mg/l
End point: mortality
Exposure time: 28 d
Test Type: static test
Method: OECD Test Guideline 211 or Equivalent

M-Factor (Chronic aquatic toxicity) : 10

Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
End point: Respiration rates.
Exposure time: 3 h
Test Type: Respiration inhibition

Toxicity to soil dwelling organisms : LC50 (*Eisenia fetida* (earthworms)): > 1,000 mg/kg
Exposure time: 14 d

Toxicity to terrestrial organisms : Remarks: Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg)., Material is moderately toxic to birds on a dietary basis (LC50 between 501 and 1000 ppm).

oral LD50 (*Colinus virginianus* (Bobwhite quail)): > 2000 mg/kg bodyweight.
Exposure time: 14 d

LC50 (*Colinus virginianus* (Bobwhite quail)): > 937 mg/kg diet.
Exposure time: 8 d

oral LD50 (*Apis mellifera* (bees)): > 100 micrograms/bee

contact LD50 (*Apis mellifera* (bees)): > 100 micrograms/bee
Exposure time: 48 h

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Dithiopyr:

Toxicity to fish : Remarks: Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive

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species).

LC50 (Oncorhynchus mykiss (rainbow trout)): 0.5 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1.1 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 0.020 mg/l
Exposure time: 5 d
Test Type: Static

ErC50 (Lemna gibba (gibbous duckweed)): 0.014 mg/l
Exposure time: 7 d

NOEC (Lemna gibba (gibbous duckweed)): 0.0024 mg/l
Exposure time: 7 d

M-Factor (Acute aquatic toxicity) : 10

M-Factor (Chronic aquatic toxicity) : 10

Toxicity to soil dwelling organisms : LC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg

Toxicity to terrestrial organisms : Remarks: Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg)., Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

oral LD50 (Colinus virginianus (Bobwhite quail)): > 2250 mg/kg bodyweight.

dietary LC50 (Colinus virginianus (Bobwhite quail)): > 5620 mg/kg diet.

contact LD50 (Apis mellifera (bees)): > 100 µg/bee
Exposure time: 48 h

oral LD50 (Apis mellifera (bees)): > 119 µg/bee
Exposure time: 48 h

Silica, crystalline (quartz):

Toxicity to fish : Remarks: Not expected to be acutely toxic to aquatic organisms.

Ecotoxicology Assessment

Acute aquatic toxicity : This product has no known ecotoxicological effects.

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Persistence and degradability

Components:

isoxaben (ISO):

Biodegradability : Result: Not biodegradable
Remarks: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
Biodegradation rate may increase in soil and/or water with acclimation.

Chemical Oxygen Demand (COD) : 1.77 mg/g

ThOD : 1.98 kg/kg

Stability in water : Test Type: Hydrolysis
Degradation half life (half-life): > 5 d pH: 7.0

Photodegradation : Test Type: Half-life (direct photolysis)
Method: Measured

Test Type: Half-life (direct photolysis)

Test Type: Half-life (indirect photolysis)

Sensitizer: OH radicals

Concentration: 1,500,000 1/cm³

Rate constant: 2.045E-10 cm³/s

Method: Estimated.

Dithiopyr:

Biodegradability : Result: Not readily biodegradable.
Remarks: Biodegradation may occur under aerobic conditions (in the presence of oxygen).

Silica, crystalline (quartz):

Biodegradability : Remarks: Biodegradation is not applicable.

Bioaccumulative potential

Components:

isoxaben (ISO):

Partition coefficient: n-octanol/water : log Pow: 2.64
Method: Measured
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Dithiopyr:

Partition coefficient: n-octanol/water :
log Pow: 4.75
Method: Measured

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Remarks: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Silica, crystalline (quartz):

Partition coefficient: n-octanol/water

: Remarks: Partitioning from water to n-octanol is not applicable.

Balance:

Partition coefficient: n-octanol/water

: Remarks: No relevant data found.

Mobility in soil

Components:

isoxaben (ISO):

Distribution among environmental compartments

: Koc: 700 - 1290
Remarks: Potential for mobility in soil is low (Koc between 500 and 2000).

Stability in soil

: Test Type: aerobic degradation
Dissipation time: 0.358 - 0.883 yr
Test Type: Photolysis
Dissipation time: 248 d

Dithiopyr:

Distribution among environmental compartments

: Koc: 20500
Remarks: Expected to be relatively immobile in soil (Koc > 5000).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Silica, crystalline (quartz):

Distribution among environmental compartments

: Remarks: No relevant data found.

Balance:

Distribution among environmental compartments

: Remarks: No relevant data found.

Other adverse effects

Components:

isoxaben (ISO):

Results of PBT and vPvB assessment

: This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Ozone-Depletion Potential

: Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

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Dithiopyr:

Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Silica, crystalline (quartz):

Results of PBT and vPvB assessment : This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Balance:

Results of PBT and vPvB assessment : This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.
If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

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Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

49 CFR

Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

SARA 311/312 Hazards : Carcinogenicity

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know

Silica, crystalline (quartz)
Dipropylene glycol

14808-60-7
25265-71-8

California Prop. 65

WARNING: This product can expose you to chemicals including Silica, crystalline (quartz), which is/are known to the State of California to cause cancer, and toluene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

The ingredients of this product are reported in the following inventories:

TSCA : Product contains substance(s) not listed on TSCA inventory.

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number : 62719-742

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

CAUTION

Harmful if absorbed through skin or inhaled
Causes moderate eye irritation.

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SECTION 16. OTHER INFORMATION

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
OSHA CARC	:	OSHA Specifically Regulated Chemicals/Carcinogens
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-3	:	USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
ACGIH / TWA	:	8-hour, time-weighted average
OSHA CARC / PEL	:	Permissible exposure limit (PEL)
OSHA P0 / TWA	:	8-hour time weighted average
OSHA Z-1 / TWA	:	8-hour time weighted average
OSHA Z-3 / TWA	:	8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

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Revision Date : 04/29/2022

Product code: GF-3985

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Snapshot® 2.5 TG

Version	Revision Date:	SDS Number:	Date of last issue: 09/12/2023
1.2	09/12/2023	800080003390	Date of first issue: 01/13/2022

Corteva Agriscience™ encourages you and expects you to read and understand the entire SDS as there is important information throughout the document. This SDS provides users with information relating to the protection of human health and safety at the workplace, protection of the environment and supports emergency response. Product users and applicators should primarily refer to the product label attached to or accompanying the product container. This Safety Data Sheet adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. IDENTIFICATION

Product name : Snapshot® 2.5 TG

Manufacturer or supplier's details

COMPANY IDENTIFICATION

Manufacturer/importer : CORTEVA AGRISCIENCE LLC
9330 ZIONSVILLE RD
INDIANAPOLIS, IN, 46268-1053
UNITED STATES

Customer Information : 1-800-258-3033
Number
E-mail address : customerinformation@corteva.com

Emergency telephone : INFOTRAC (CONTRACT 84224).
+1 800-992-5994 or +1 317-337-6009

Recommended use of the chemical and restrictions on use

Recommended use : End use herbicide product

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Carcinogenicity : Category 1A

Specific target organ toxicity : Category 1 (Lungs)
- repeated exposure (Inhalation)

GHS label elements

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SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



Snapshot® 2.5 TG

Version 1.2 Revision Date: 09/12/2023 SDS Number: 800080003390 Date of last issue: 09/12/2023
Date of first issue: 01/13/2022

Hazard pictograms



Signal Word

: Danger

Hazard Statements

: H350 May cause cancer.
H372 Causes damage to organs (Lungs) through prolonged or repeated exposure if inhaled.

Precautionary Statements

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
isoxaben (ISO)	82558-50-7	0.5
trifluralin (ISO) (containing <0.5 ppm NPDA)	1582-09-8	2
Quartz	14808-60-7	>= 3 - < 10
Balance	Not Assigned	> 80

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

If inhaled : Move person to fresh air. If person is not breathing, call an

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according to the OSHA Hazard Communication Standard



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- emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.
If breathing is difficult, oxygen should be administered by qualified personnel.
- In case of skin contact : Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
- In case of eye contact : Hold eyes 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 eyes. Call a poison control center or doctor for treatment advice.
May cause injury due to mechanical action.
- If swallowed : Call a poison control center 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 the poison control center or doctor.
Never give anything by mouth to an unconscious person.
- Most important symptoms and effects, both acute and delayed : None known.
- Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection).
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
- Notes to physician : Maintain adequate ventilation and oxygenation of the patient.
No specific antidote.
Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.
Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

SECTION 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Water spray
Foam
Carbon dioxide (CO₂)
Dry chemical
- Unsuitable extinguishing media : None known.
- Specific hazards during fire fighting : Exposure to combustion products may be a hazard to health.
Do not allow run-off from fire fighting to enter drains or water courses.

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Hazardous combustion products : During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.

Combustion products may include and are not limited to:
Nitrogen oxides (NO_x)
Hydrogen fluoride
Carbon oxides

Specific extinguishing methods : Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Use water spray to cool unopened containers.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.
Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Ensure adequate ventilation.
Avoid dust formation.
Avoid breathing dust.
Use personal protective equipment.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions : If the product contaminates rivers and lakes or drains inform respective authorities.
Discharge into the environment must be avoided.
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.
Prevent from entering into soil, ditches, sewers, underwater.
See Section 12, Ecological Information.

Methods and materials for containment and cleaning up : Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in.
Pick up and arrange disposal without creating dust.
Recovered material should be stored in a vented container.
The vent must prevent the ingress of water as further reaction with spilled materials can take place which could lead to over-pressurization of the container.
Keep in suitable, closed containers for disposal.

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Sweep up or vacuum up spillage and collect in suitable container for disposal.
See Section 13, Disposal Considerations, for additional information.

SECTION 7. HANDLING AND STORAGE

- Local/Total ventilation : Use with local exhaust ventilation.
- Advice on safe handling : Provide sufficient air exchange and/or exhaust in work rooms.
Avoid formation of respirable particles.
Do not breathe vapors/dust.
Handle in accordance with good industrial hygiene and safety practice.
Avoid exposure - obtain special instructions before use.
Smoking, eating and drinking should be prohibited in the application area.
Do not get on skin or clothing.
Do not swallow.
Avoid contact with eyes.
Keep container tightly closed.
Take care to prevent spills, waste and minimize release to the environment.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
- Conditions for safe storage : Store in a closed container.
Prevent unauthorized access.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep in properly labeled containers.
Store in accordance with the particular national regulations.
- Materials to avoid : Strong oxidizing agents
Organic peroxides
Explosives
Gases

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Quartz	14808-60-7	TWA (Respirable dust)	0.05 mg/m3	OSHA Z-1
		TWA (respirable)	10 mg/m3 / %SiO ₂ +2	OSHA Z-3
		TWA (respirable)	250 mppcf / %SiO ₂ +5	OSHA Z-3
		TWA (Res-	0.025 mg/m3	ACGIH

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		pirable particulate matter)	(Silica)	
		TWA (respirable dust fraction)	0.1 mg/m3	OSHA P0
		PEL (respirable)	0.05 mg/m3	OSHA CARC

Engineering measures : Use engineering controls to maintain airborne level below exposure limit requirements or guidelines.
If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation.
Local exhaust ventilation may be necessary for some operations.

Personal protective equipment

Respiratory protection : Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines.
If there are no applicable exposure limit requirements or guidelines, use an approved respirator.
Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material.
For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.

Hand protection

Remarks : Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection : Use safety glasses (with side shields).
If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles.

Skin and body protection : Wear clean, body-covering clothing.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Granules.

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Color	: light yellow
Odor	: Aromatic
Odor Threshold	: No data available
pH	: 7.5 (50% dispersion)
Melting point/range	: No data available
Freezing point	: Not applicable
Boiling point/boiling range	: Not applicable
Flash point	: Method: closed cup Not applicable
Evaporation rate	: Not applicable
Flammability (solid, gas)	: No
Upper explosion limit / Upper flammability limit	: Not applicable
Lower explosion limit / Lower flammability limit	: Not applicable
Vapor pressure	: Not applicable
Relative vapor density	: Not applicable
Density	: Not applicable
Bulk density	: 0.70 g/cm ³ (74.1 °F / 23.4 °C) Method: Loose Volumetric
Solubility(ies) Water solubility	: No data available
Autoignition temperature	: > 999 °F / > 537 °C
Viscosity Viscosity, dynamic	: Not applicable
Explosive properties	: No
Oxidizing properties	: No significant increase (>5C) in temperature.

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SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Not classified as a reactivity hazard.
Chemical stability	: No decomposition if stored and applied as directed. Stable under normal conditions.
Possibility of hazardous reactions	: Stable under recommended storage conditions.
Conditions to avoid	: None known.
Incompatible materials	: Strong acids Strong bases
Hazardous decomposition products	: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Nitrogen oxides (NOx) Hydrogen fluoride Carbon oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	: LD50 (Rat): > 2,500 mg/kg Symptoms: No deaths occurred at this concentration. Assessment: The substance or mixture has no acute oral toxicity Remarks: Information source: Internal study report
Acute dermal toxicity	: LD50 (Rabbit, male and female): > 5,000 mg/kg Remarks: Information source: Internal study report

Components:

isoxaben (ISO):

Acute oral toxicity	: LD50 (Rat, male and female): > 5,000 mg/kg
Acute inhalation toxicity	: Remarks: Prolonged excessive exposure to dust may cause adverse effects. Based on the available data, narcotic effects were not observed. Based on the available data, respiratory irritation was not observed. LC50 (Rat, male and female): > 2.93 mg/l

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Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

Symptoms: No deaths occurred at this concentration.
Remarks: Maximum attainable concentration.

Acute dermal toxicity : LD50 (Rabbit, male and female): > 2,000 mg/kg
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute dermal toxicity

trifluralin (ISO) (containing <0.5 ppm NPDA):

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : Remarks: Vapors are unlikely due to physical properties.
No adverse effects are anticipated from single exposure to dust.
Based on the available data, respiratory irritation was not observed.

LC50 (Rat): > 4.8 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg

Skin corrosion/irritation

Product:

Species : Rabbit
Result : No skin irritation

Components:

isoxaben (ISO):

Species : Rabbit
Result : No skin irritation

trifluralin (ISO) (containing <0.5 ppm NPDA):

Result : No skin irritation

Quartz:

Result : No skin irritation

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Serious eye damage/eye irritation

Product:

Species	: Rabbit
Result	: No eye irritation

Components:

isoxaben (ISO):

Species	: Rabbit
Result	: No eye irritation

trifluralin (ISO) (containing <0.5 ppm NPDA):

Result	: No eye irritation
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Quartz:

Result	: No eye irritation
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Respiratory or skin sensitization

Product:

Species	: Guinea pig
Assessment	: Does not cause skin sensitization.

Components:

isoxaben (ISO):

Remarks	: Did not cause allergic skin reactions when tested in guinea pigs.
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Remarks	: For respiratory sensitization: No relevant data found.
---------	---

trifluralin (ISO) (containing <0.5 ppm NPDA):

Assessment	: May cause sensitization by skin contact.
Remarks	: Skin contact may cause an allergic skin reaction.

Remarks	: For respiratory sensitization: No relevant data found.
---------	---

Germ cell mutagenicity

Components:

isoxaben (ISO):

Germ cell mutagenicity - Assessment	: In vitro genetic toxicity studies were negative., Animal genetic toxicity studies were predominantly negative.
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trifluralin (ISO) (containing <0.5 ppm NPDA):

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Germ cell mutagenicity - Assessment : In vivo tests did not show mutagenic effects

In vitro genetic toxicity studies were predominantly negative.,
Animal genetic toxicity studies were predominantly negative.

Quartz:

Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative in some cases and positive in other cases.

Carcinogenicity

Components:

isoxaben (ISO):

Carcinogenicity - Assessment : An increase in nonmalignant liver tumors was observed with isoxaben in one of two species tested.

trifluralin (ISO) (containing <0.5 ppm NPDA):

Carcinogenicity - Assessment : Animal testing did not show any carcinogenic effects.

A low incidence of urinary tract tumors was seen in only 1 of 5 chronic studies in rats with trifluralin. Trifluralin is not anticipated to be a carcinogenic risk to man.

Quartz:

Carcinogenicity - Assessment : Human carcinogen.

Has caused cancer in humans., Has caused cancer in laboratory animals.

IARC	Group 1: Carcinogenic to humans Quartz (Silica dust, crystalline)	14808-60-7
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OSHA	OSHA specifically regulated carcinogen Quartz (crystalline silica)	14808-60-7
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NTP	Known to be human carcinogen Quartz (Silica, Crystalline (Respirable Size))	14808-60-7
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Reproductive toxicity

Components:

isoxaben (ISO):

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Reproductive toxicity - Assessment : In animal studies, has been shown to interfere with reproduction in females. Effects have been seen only at doses that produced significant toxicity to the parent animals. Has caused birth defects in laboratory animals only at doses toxic to the mother.

trifluralin (ISO) (containing <0.5 ppm NPDA):

Reproductive toxicity - Assessment : Animal testing did not show any effects on fertility.

In animal studies, did not interfere with reproduction. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Quartz:

Reproductive toxicity - Assessment : For similar material(s); Did not cause birth defects or any other fetal effects in laboratory animals.

STOT-single exposure

Product:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Components:

isoxaben (ISO):

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

trifluralin (ISO) (containing <0.5 ppm NPDA):

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Quartz:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

STOT-repeated exposure

Components:

isoxaben (ISO):

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Quartz:

Routes of exposure : Inhalation

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Target Organs Assessment : Lungs
: Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

isoxaben (ISO):

Remarks : In animals, effects have been reported on the following organs:
Liver.
Kidney.

trifluralin (ISO) (containing <0.5 ppm NPDA):

Remarks : In animals, effects have been reported on the following organs:
Kidney.
Blood.
Liver.
Thyroid.

Quartz:

Remarks : In humans, effects have been reported on the following organs:
Kidney.
Repeated excessive exposure to crystalline silica may cause silicosis, a progressive and disabling disease of the lungs.

Aspiration toxicity

Product:

Based on physical properties, not likely to be an aspiration hazard.

Components:

isoxaben (ISO):

Based on physical properties, not likely to be an aspiration hazard.

trifluralin (ISO) (containing <0.5 ppm NPDA):

Based on physical properties, not likely to be an aspiration hazard.

Quartz:

Based on physical properties, not likely to be an aspiration hazard.

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SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

- Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 230 mg/l
Exposure time: 96 h
Test Type: semi-static test
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia pulex (Water flea)): > 1,000 mg/l
Exposure time: 48 h
- Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l
Exposure time: 96 h
- Toxicity to soil dwelling organisms : LC50 (Eisenia fetida (earthworms)): > 10,000 mg/kg
Exposure time: 14 d
End point: survival
- Toxicity to terrestrial organisms : Remarks: Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

oral LD50 (Colinus virginianus (Bobwhite quail)): > 2000 mg/kg bodyweight.

Components:

isoxaben (ISO):

- Toxicity to fish : Remarks: Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

LC50 (Oncorhynchus mykiss (rainbow trout)): 1.2 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203 or Equivalent
Remarks: The LC50 value is above the water solubility.

LC50 (Cyprinodon variegatus (sheepshead minnow)): > 0.87 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203 or Equivalent
Remarks: The LC50 value is above the water solubility.
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1.3 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202 or Equivalent
- Toxicity to algae/aquatic plants : EbC50 (Lemna minor (duckweed)): 0.011 mg/l
End point: Biomass

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Exposure time: 7 d
Test Type: static test
Method: OECD Test Guideline 201 or Equivalent

ErC50 (*Pseudokirchneriella subcapitata* (green algae)): > 1.2 mg/l
End point: Growth rate inhibition
Exposure time: 72 h
Test Type: static test

ErC50 (*Skeletonema costatum* (marine diatom)): > 0.49 mg/l
Exposure time: 72 h
Test Type: static test

M-Factor (Acute aquatic toxicity) : 10

Toxicity to fish (Chronic toxicity) : NOEC (*Pimephales promelas* (fathead minnow)): 0.4 mg/l
End point: growth
Exposure time: 33 d
Test Type: semi-static test

LOEC (*Pimephales promelas* (fathead minnow)): > 0.40 mg/l
End point: growth
Exposure time: 33 d
Test Type: semi-static test

MATC (Maximum Acceptable Toxicant Level) (*Pimephales promelas* (fathead minnow)): > 0.40 mg/l
End point: growth
Exposure time: 33 d
Test Type: semi-static test

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (*Daphnia magna* (Water flea)): 0.69 mg/l
End point: growth
Exposure time: 21 d
Test Type: static test
Method: OECD Test Guideline 211 or Equivalent

LOEC (*Daphnia magna* (Water flea)): 1.01 mg/l
End point: growth
Exposure time: 21 d
Test Type: static test
Method: OECD Test Guideline 211 or Equivalent

MATC (Maximum Acceptable Toxicant Level) (*Daphnia magna* (Water flea)): 0.85 mg/l
End point: growth
Exposure time: 21 d
Test Type: static test
Method: OECD Test Guideline 211 or Equivalent

NOEC (saltwater mysid *Mysidopsis bahia*): 0.841 mg/l
Exposure time: 28 d

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Test Type: flow-through test

LOEC (saltwater mysid *Mysidopsis bahia*): > 0.841 mg/l

Exposure time: 28 d

Test Type: flow-through test

NOEC (Midge (*Chironomus riparius*)): 32 mg/l

End point: mortality

Exposure time: 28 d

Test Type: static test

Method: OECD Test Guideline 211 or Equivalent

LOEC (Midge (*Chironomus riparius*)): 64 mg/l

End point: mortality

Exposure time: 28 d

Test Type: static test

Method: OECD Test Guideline 211 or Equivalent

MATC (Maximum Acceptable Toxicant Level) (Midge (*Chironomus riparius*)): 48 mg/l

End point: mortality

Exposure time: 28 d

Test Type: static test

Method: OECD Test Guideline 211 or Equivalent

M-Factor (Chronic aquatic toxicity) : 10

Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
End point: Respiration rates
Exposure time: 3 h
Test Type: Respiration inhibition

Toxicity to soil dwelling organisms : LC50 (*Eisenia fetida* (earthworms)): > 1,000 mg/kg
Exposure time: 14 d

Toxicity to terrestrial organisms : Remarks: Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg)., Material is moderately toxic to birds on a dietary basis (LC50 between 501 and 1000 ppm).

oral LD50 (*Colinus virginianus* (Bobwhite quail)): > 2000 mg/kg bodyweight.
Exposure time: 14 d

LC50 (*Colinus virginianus* (Bobwhite quail)): > 937 mg/kg diet.
Exposure time: 8 d

oral LD50 (*Apis mellifera* (bees)): > 100 micrograms/bee

contact LD50 (*Apis mellifera* (bees)): > 100 micrograms/bee
Exposure time: 48 h

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Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

trifluralin (ISO) (containing <0.5 ppm NPDA):

Toxicity to fish : Remarks: Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

LC50 (Oncorhynchus mykiss (rainbow trout)): 0.088 mg/l
Exposure time: 96 h
Test Type: flow-through test

LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.089 mg/l
Exposure time: 96 h
Test Type: flow-through test

Toxicity to daphnia and other aquatic invertebrates : EC50 (water flea Daphnia magna): 0.245 mg/l
Exposure time: 48 h
Test Type: static test

EC50 (mussel Mytilus edulis): 0.096 mg/l
Exposure time: 48 h
Test Type: static test

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 0.0532 mg/l
Exposure time: 72 h

EC50 (Lemna gibba): 0.043 mg/l
Exposure time: 7 d
Test Type: Growth inhibition

EbC50 (diatom Navicula sp.): 0.015 mg/l
End point: Biomass
Exposure time: 5 d

M-Factor (Acute aquatic toxicity) : 10

Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): 0.00114 mg/l
End point: growth
Exposure time: 48 d
Test Type: static test

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.0507 mg/l
End point: growth
Exposure time: 21 d
Test Type: semi-static test

M-Factor (Chronic aquatic toxicity) : 10

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Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
Exposure time: 3 h

Toxicity to soil dwelling organisms : LC50 (*Eisenia fetida* (earthworms)): > 1,000 mg/kg
Exposure time: 14 d

Toxicity to terrestrial organisms : Remarks: Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg)., Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

oral LD50 (*Colinus virginianus* (Bobwhite quail)): > 2250 mg/kg bodyweight.

dietary LC50 (*Colinus virginianus* (Bobwhite quail)): > 5000 mg/kg diet.
Exposure time: 5 d

oral LD50 (*Apis mellifera* (bees)): > 100 micrograms/bee

contact LD50 (*Apis mellifera* (bees)): > 100 micrograms/bee

Quartz:

Toxicity to fish : Remarks: Based on information for a similar material:
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50 (*Danio rerio* (zebra fish)): 508 mg/l
Exposure time: 96 h
Remarks: Based on information for a similar material:

Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna* (Water flea)): 731 mg/l
Exposure time: 48 h
Remarks: For similar material(s):

Persistence and degradability

Components:

Isoxaben (ISO):

Biodegradability : Result: Not biodegradable
Remarks: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
Biodegradation rate may increase in soil and/or water with acclimation.

Chemical Oxygen Demand (COD) : 1.77 mg/g

ThOD : 1.98 kg/kg

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Stability in water : Test Type: Hydrolysis
Degradation half life (half-life): > 5 d pH: 7.0

Photodegradation : Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Concentration: 1,500,000 1/cm³
Rate constant: 2.045E-10 cm³/s
Method: Estimated.

trifluralin (ISO) (containing <0.5 ppm NPDA):

Biodegradability : Remarks: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Concentration: 10 mg/l
Result: Not readily biodegradable.
Biodegradation: 5 %
Exposure time: 28 d
Method: OECD Test Guideline 301B or Equivalent
Remarks: 10-day Window: Fail

Chemical Oxygen Demand (COD) : 1.37 kg/kg

Stability in water : Test Type: Hydrolysis
Degradation half life (half-life): > 1 yr pH: 3 - 9
Method: Measured

Test Type: Photolysis
Degradation half life (half-life): 0.19 - 3.08 h
Method: Measured

Photodegradation : Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Concentration: 1,500,000 1/cm³
Rate constant: 2.4004E-11 cm³/s
Method: Estimated.

Quartz:

Biodegradability : Remarks: Biodegradation is not applicable.

Bioaccumulative potential

Components:

isoxaben (ISO):

Partition coefficient: n-octanol/water : log Pow: 2.64
Method: Measured
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

trifluralin (ISO) (containing <0.5 ppm NPDA):

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Snapshot® 2.5 TG

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Bioaccumulation	: Species: Pimephales promelas (fathead minnow) Bioconcentration factor (BCF): 1,060 - 6,000 Concentration: 0.0018 mg/l Method: Estimated.
Partition coefficient: n-octanol/water	: log Pow: 5.27 Method: Method Not Specified. Remarks: Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).
Quartz: Partition coefficient: n-octanol/water	: Remarks: Partitioning from water to n-octanol is not applicable.
Balance: Partition coefficient: n-octanol/water	: Remarks: No relevant data found.
Mobility in soil	
<u>Components:</u>	
isoxaben (ISO):	
Distribution among environmental compartments	: Koc: 700 - 1290 Remarks: Potential for mobility in soil is low (Koc between 500 and 2000).
Stability in soil	: Test Type: aerobic degradation Dissipation time: 0.358 - 0.883 yr Test Type: Photolysis Dissipation time: 248 d
Quartz: Distribution among environmental compartments	: Remarks: No relevant data found.
Balance: Distribution among environmental compartments	: Remarks: No relevant data found.
Other adverse effects	
<u>Components:</u>	
isoxaben (ISO):	
Results of PBT and vPvB assessment	: This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

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Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

trifluralin (ISO) (containing <0.5 ppm NPDA):

Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Quartz:

Results of PBT and vPvB assessment : This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Balance:

Results of PBT and vPvB assessment : This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.
If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number : UN 3077
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,

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	N.O.S. (Trifluralin)
Class	: 9
Packing group	: III
Labels	: 9
Environmentally hazardous	: yes
IATA-DGR	
UN/ID No.	: UN 3077
Proper shipping name	: Environmentally hazardous substance, solid, n.o.s. (Trifluralin)
Class	: 9
Packing group	: III
Labels	: Miscellaneous
Packing instruction (cargo aircraft)	: 956
Packing instruction (passenger aircraft)	: 956
IMDG-Code	
UN number	: UN 3077
Proper shipping name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Trifluralin)
Class	: 9
Packing group	: III
Labels	: 9
EmS Code	: F-A, S-F
Marine pollutant	: yes(Trifluralin)
Remarks	: Stowage category A

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

49 CFR Road

UN/ID/NA number	: UN 3077
Proper shipping name	: Environmentally hazardous substance, solid, n.o.s. (Trifluralin)
Class	: 9
Packing group	: III
Labels	: CLASS 9
ERG Code	: 171
Marine pollutant	: no
Reportable Quantity	: Trifluralin only regulated in pack sizes > 226 kg

Further information

Marine Pollutants assigned UN number 3077 and 3082 in single or combination packaging containing a net quantity per single or inner packaging of 5L or less for liquids or having a net mass per single or inner packaging of 5 KG or less for solids may be transported as non-dangerous goods as provided in section 2.10.2.7 of IMDG code, IATA Special provision A197, and ADR/RID special provision 375.

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Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

SARA 311/312 Hazards : Carcinogenicity
Specific target organ toxicity (single or repeated exposure)

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

trifluralin (ISO)	1582-09-8	>= 1 - < 5 %
(containing <0.5 ppm NPDA)		

US State Regulations

Pennsylvania Right To Know

Quartz	14808-60-7
trifluralin (ISO) (containing <0.5 ppm NPDA)	1582-09-8

California Prop. 65

WARNING: This product can expose you to chemicals including Quartz, Kaolin, Quartz, which is/are known to the State of California to cause cancer, and toluene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

The ingredients of this product are reported in the following inventories:

TSCA : Product contains substance(s) not listed on TSCA inventory.

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number : 62719-175

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

CAUTION

Causes moderate eye irritation

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Harmful if swallowed or inhaled
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

SECTION 16. OTHER INFORMATION

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
OSHA CARC	:	OSHA Specifically Regulated Chemicals/Carcinogens
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-3	:	USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
ACGIH / TWA	:	8-hour, time-weighted average
OSHA CARC / PEL	:	Permissible exposure limit (PEL)
OSHA P0 / TWA	:	8-hour time weighted average
OSHA Z-1 / TWA	:	8-hour time weighted average
OSHA Z-3 / TWA	:	8-hour time weighted average

ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; ASTM - American Society for the Testing of Materials; ECx - Concentration associated with x% response; EmS - Emergency Schedule; ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - not otherwise specified; NOEC - Non-Observed Effective Concentration; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; (Q)SAR - (Quantitative) Structure Activity Relationship; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SDS - Safety Data Sheet; UN - United Nations.

CFR	-	Code of Federal Regulations.
IARC	-	International Agency for Research on Cancer.
IATA-DGR	-	International Air Transport Association Dangerous Goods Regulations.
OSHA	-	Occupational Safety and Health Administration.
RCRA	-	Resource Conservation and Recovery Act.
RQ	-	Reportable Quantity.
SARA	-	Superfund Amendments and Reauthorization Act.
TSCA	-	Toxic Substances Control Act.

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Product code: FN-3278

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US / EN

Memorandum

To: Parks Public Landscape Advisory Board (PPLAB)
From: Abby McNeal, CSFM, CPRP
Date: 06/04/2025
Re: Parks Division Monthly Report

Streetscapes/ Horticulture:

Staff planted and installed patio hanging baskets and corner pots

Completed the Transformative Landscape Change Challenge at the arboretum installing 270 plants provided by Resource Central and the Colorado Water Conservation Board: Sunlit Fiesta ([Sunlit Fiesta](#)) and Color Pop ([Color Pop](#))

Follow up on the pollinator plantings that can be found at the Arboretum shrubs: Golden Current, Perennials include: Catmint (Nepeta), Purple Cone flower (Echinacea), Black-eyed Susan (Rudbeckia), Butterfly Weed (Asclepias), Blanket flower (Gaillardia)

Planted annuals for throughout the parks landscape beds

Parks, Athletic Fields, Cemetery:

Supporting general parks maintenance: shelter permits and special events started

Mowing and trimming weekly.

Athletic Fields work on preparing infields for tournaments and permitted play

Forestry:

Planted 25 trees in collaboration with Tree Foundation, PLAY Boulder, and Boulder Youth Corp tree planting 3 locations: Washington Ave, S Boulder Road, Cleo Mudrock detention area

Projects:

Playgrounds/ Park Renovations (Sunflower/Enclave) –on schedule

Irrigation Improvements – controller purchased and installations 22 of 26 (mid-June)

PPLAB Development Review:

None at June meeting