



VANDAL[®] 4SC

GROUP

14

HERBICIDE

ACTIVE INGREDIENT:

Sulfentrazone:.....

% BY WT.

39.6%

OTHER INGREDIENTS:.....

60.4%

TOTAL:.....

100.0%

Contains 4 pounds of active ingredient per gallon

KEEP OUT OF REACH OF CHILDREN CAUTION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

See inside label booklet for additional Precautionary Statements and Directions for Use including Storage and Disposal instructions.

FIRST AID

If on Skin or Clothing: 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 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.

HOTLINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may contact CHEMTREC at 1-800-424-9300 in the event of an emergency.

EPA Reg No 89168-48-89391

HERBICIDE



Distributed By:
INNVICTIS[®] CROP CARE, LLC
1880 Fall River Drive, Suite 100
Loveland, CO 80538

010616R111716A

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

Caution

Harmful if swallowed or absorbed through skin. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear long sleeved shirt and long pants, chemical resistant gloves such as Neoprene Rubber, Natural Rubber, Polyethylene, Polyvinyl Chloride or Viton, and shoes plus socks. Remove and wash contaminated clothing before reuse.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should:

Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Environmental Hazards

This pesticide is toxic to marine/estuarine invertebrates. Do not apply directly to water to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to terrestrial and aquatic plants in neighboring areas. Do not contaminate water when disposing of equipment washwaters or rinsate.

Groundwater advisory: This chemical is known to leach through soil into groundwater under certain conditions as a result of label use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Do not use on coarse soils classified as sand which have less than 1% organic matter.

Surface water advisory: Sulfentrazone can contaminate surface water through spray drift. Under some conditions Sulfentrazone may also have a high potential for runoff into surface water (primarily via dissolution in runoff water) for several to many months post application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas overlying extremely shallow groundwater, areas with in-field canals or ditches that drain to surface water areas not separated from adjacent surface waters with vegetated filter strips, and areas over lying tile drainage systems that drain to surface waters.

Physical/Chemical Hazards

Do not mix or allow contact with oxidizing agents. Hazardous chemical reaction may occur. Do not use or store near heat or open flame.

TANK MIXING RESTRICTIONS

It is the pesticide user's responsibility to ensure that all products in the listed mixtures are registered for the intended use. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Observe all instructions, crop restrictions, mixing directions, application precautions, replanting directions, rotational crop guidelines, and other label information of each product when tank mixing with *VANDAL 45C*.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons either directly or through drift. Only protected handlers may be in the area during application.

Do not apply more than the allowed amount of *VANDAL 45C* per acre per twelve month period as stated in Table 4. The twelve month period is considered to begin upon the initial *VANDAL 45C* application.

For any requirements specific to your State or Tribe consult the Agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. These requirements only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

Personal Protective Equipment (PPE) required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated such as plants, soil, or water is: coveralls over long sleeved shirt and long pants, chemical resistant gloves made of any waterproof material and shoes plus socks.

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Reentry Statement: Do not allow people (other than applicator) or pets on treatment area during application. Do not enter treatment area until spray has dried.

RESISTANCE MANAGEMENT

Some weeds are known to develop resistance to herbicides that have been used repeatedly. While the development of herbicide resistance is well understood it is not easily predicted. Therefore, herbicides should be used in conjunction with the resistance management strategies in the area. Consult the local or State agricultural advisors for details. If herbicide resistance should develop in the area, this product used alone may not continue to provide sufficient levels of weed control. If the reduced levels of control cannot be attributed to improper application techniques, improper use rates, improper application timing, unfavorable weather conditions, or abnormally high weed pressure, a resistant strain of weeds may have developed.

To reduce the potential for weed resistance use this product in a rotation program with other classes of chemistry and modes of action. Always apply this product at the listed rates and in accordance with the use directions. Do not use less than listed label rates alone or in tank mixtures. Do not use reduced rates of the tank mix partner. For optimum performance, scout fields carefully and begin applications when weeds are smaller rather than larger. If resistance is suspected contact the local or State agricultural advisors

PRODUCT INFORMATION

VANDAL 45C is a selective, soil applied herbicide for the control of susceptible broadleaf grass and sedge weeds. **VANDAL 45C** is formulated containing 4 pounds per gallon of the active ingredient Sulfentrazone. If adequate moisture (1/2" to 1") from rainfall or irrigation is not received within 7 to 10 days after the **VANDAL 45C** treatment, a shallow incorporation may be needed to obtain desired weed control. When activating moisture is received after dry conditions **VANDAL 45C** will provide a reduced level of control of susceptible germinating weeds. Soil applications of **VANDAL 45C** must be made before crop seed germination to prevent injury to the emerging crop seedlings. When applications after planting are delayed injury may occur if seeds are germinating or if they are located near the soil surface.

Proper handling instructions: **VANDAL 45C** may not be mixed or loaded within 50 feet of any wells (including abandoned wells and drainage wells) sinkholes, perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs. This setback does not apply to properly capped or plugged abandoned wells and does not apply to impervious pads or properly diked mixing/loading areas.

Operations that involve mixing, loading, rinsing or washing of this product into or from pesticide handling or application equipment or containers within 50 feet of any well are prohibited unless conducted on an impervious pad constructed to withstand the weight of the heaviest load that may be positioned on or moved across the pad. Such a pad shall be designed and maintained to contain any product spills or equipment leaks, container or equipment rinse or washwater and rainwater that may fall on the pad. Surface water shall not be allowed to either flow over or from the pad which means the pad must be self contained. The pad shall be sloped to facilitate material removal. An unroofed pad shall be of sufficient capacity to contain at a minimum 110% of the capacity of the largest pesticide container or application equipment on the pad. A pad that is covered by a roof of sufficient size to completely exclude precipitation from contact with the pad shall have a minimum containment capacity of 100% of the capacity of the largest pesticide container or application equipment on the pad. Containment capacities as described above shall be maintained at all times. The above specific minimum containment capacities do not apply to vehicles when delivering pesticide shipments to the mixing/loading site. States may have in effect additional requirements regarding wellhead setbacks and operational containment. Product must be used in a manner that will prevent back siphoning in wells, spills or improper disposal of excess pesticide spray mixtures or rinsates.

APPLICATION INSTRUCTIONS

VANDAL 45C may be applied to soil as a preplant incorporated treatment or as a pre emergence (prior to weed and/or crop emergence) surface application. Additional application methods include post plant treatments, Over-the-top and lay-by in various crops. Application methods are defined in the following Crop Use Directions sections.

Preplant incorporated treatments require a uniform surface application followed by incorporation. Do not incorporate to a depth greater than 2 inches which may result in poor weed control. Care must be taken not to create overlaps in treated zones due to soil movement which will result in excessive **VANDAL 45C** rates that could result in adverse crop response.

All soil applications and the residual activity of post plant applications of **VANDAL 45C** require adequate moisture for herbicidal activation. The ultimate amount of moisture, whether supplied by rainfall or irrigation, is dependent on several factors. These factors include, but are not limited to, existing soil moisture at application, soil type, organic matter, and till. In crop situations dependent on rainfall, **VANDAL 45C** can await activating moisture for extended periods (10 to 14 days or longer) depending on the soil parameters described above. Once activated **VANDAL 45C** will provide activity on existing weeds. The level of activity will depend on the weed species and their size at time of activation. Where irrigation is not available and rainfall has not provided activation, particularly for surface applications of **VANDAL 45C**, a shallow incorporation is recommended for destruction of any germinating weeds and to incorporate **VANDAL 45C**. Herbicide incorporation will initiate the process of activation with existing soil moisture. In circumstances where prolonged periods without rainfall and/or irrigation is not possible alternative or additional weed management practices (cultivation or post applied herbicides) may be required.

Extreme care must be exercised and the Crop Specific Use Directions followed exactly in crops allowing post plant applications of **VANDAL 45C**. Over-the-top and lay-by applications will provide contact and residual weed control depending on species. The addition of surfactants may increase contact weed control performance, but may also increase the risk of adverse crop response as well.

VANDAL 45C HERBICIDE PRODUCT USE RATES

The following directions for the selection of **VANDAL 45C** application rates are critical to achieve maximum performance and to insure maximum crop safety. The user is required to read and follow the specific **VANDAL 45C** use directions and restrictions for each crop as defined in subsequent sections of this label. The user is cautioned that some crops respond differently to **VANDAL 45C**. This response is governed by the **VANDAL 45C** application rate, various soil factors and inherent crop sensitivity. The Crop Specific Use Directions have been designed to minimize the risk of adverse crop response while maintaining optimum weed control.

Mode of Action

Sulfentrazone the active ingredient in **VANDAL 45C** is a potent inhibitor of the enzyme Protoporphyrinogen Oxidase IX (PPO IX) required for the formation of chlorophyll. Inhibition of PPO IX enzyme results in the liberation of singlet oxygen (O) that in turn disrupts cellular membranes and causes cellular leakage. The ultimate manifestation of the process is cellular death leading to plant death. The selective herbicidal activity of Sulfentrazone is based on its greater affinity for the PPO IX enzyme in weed species versus crop plants

Mechanism of Action

Following the application of **VANDAL 45C** to soil germinating seeds and seedlings take up Sulfentrazone from the soil solution. The amount of Sulfentrazone in soil solution and available for weed uptake is determined primarily by soil type, organic matter, and soil pH. Sulfentrazone adsorbs to the clay and organic matter (OM) fractions of soils effectively limiting the amount of active ingredient immediately available to control weeds. Soils typically increase in clay content through the series from coarse to fine as noted in the following Soil Classification Chart Table 1.

SOIL CLASSIFICATION CHART

Table 1

COARSE	MEDIUM	FINE
Sand	Sandy clay loam	Silty clay loam
Loamy Sand	Sandy clay	Silty clay
Sandy loam	Loam	Clay loam
	Silt loam	Clay
	Silt	

Influence of Soil type organic matter and pH on VANDAL 45C Use Rates and Crop Response

Soil organic matter content can vary widely and independently of soil type and requires an accurate analysis of representative soil samples to determine its content. Soil pH also exerts a dramatic affect on Sulfentrazone availability in the soil solution. As soil pH increases Sulfentrazone availability increases. Accurate soil pH information will require an accurate analysis of representative soil samples.

The total amount of Sulfentrazone available in solution many given soil is determined by the interaction of soil type (clay content), % organic matter, and pH. The application timing (relative to the emergence of the crop and weeds) and amount of rainfall and/or irrigation received will ultimately determine, in conjunction with the soil parameters and pH, the amount of Sulfentrazone in soil solution. It is important to note that **VANDAL 45C** can await activating moisture. However, diminished weed control may result due to the successive increase in weed growth versus timing of activation.

It is important to note that irrigation with highly alkaline water (high pH) following a **VANDAL 45C** soil application can also significantly increase the amount of Sulfentrazone available in the soil solution. Irrigation with water having a pH greater than 7.5 could result in adverse crop response. This response will ultimately depend on initial **VANDAL 45C** application rate, timing, amount, and pH of irrigation water and sensitivity of the crop and its growth stage when irrigated. The risk of adverse crop response will lessen with the advance in growth stage among most crops. The following Crop Specific Use Directions have been designed with specific **VANDAL 45C** recommendations for each crop based on the soil type, soil organic matter, and soil pH interactions described above. The user is cautioned that crop tolerance and weed control performance are based on strict adherence to these recommendations.

APPLICATION AND RESTRICTION INFORMATION

Ground Application

Utilize a boom and nozzle sprayer equipped with the appropriate nozzles, spray tips, and screens and adjusted to provide optimum spray distribution and coverage at the appropriate operating pressures. Utilize nozzles that produce minimal amounts of fine spray droplets to avoid spray drift or inadequate foliar and/or soil coverage. Apply a minimum of 10 gallons of finished spray per acre by ground. Be aware that overlaps and slower ground speeds while starting, stopping, or turning while spraying may result in excessive application and subsequent crop response. Do not apply when wind speed favors drift beyond the area intended for treatment. Do not apply using a mechanically pressurized handgun.

Aerial Application

Use nozzle types and arrangements that will provide optimum coverage while producing a minimal amount of fine droplets. Apply sufficient spray volume to achieve adequate coverage. Apply a minimum of 5 gallons of finished spray per acre.

Do not apply when wind speed favors drift beyond the area intended for treatment.

Chemigation Application

VANDAL 45C may be applied through sprinkler irrigation systems including center pivot, lateral move, end tow, solid set, or hand move irrigation systems. Do not apply this product through any other type of irrigation system. Do not connect any irrigation system (including greenhouse systems) used for pesticide application to a public water system. Crop injury, lack of effectiveness, or illegal residues on or in the crop can result from non-uniform distribution of treated water. If you have questions about calibration, you should contact State Extension Service Specialists, equipment manufacturers, or other experts. A person knowledgeable of the chemigation system and responsible for its operation or under the supervision of the responsible person shall shut the system down and make necessary adjustments should the need arise.

It is important to note that irrigation with highly alkaline water (high pH) following a **VANDAL 45C** soil application can also significantly increase the amount of Sulfentrazone available in soil solution. Irrigation with water having a pH greater than 7.5 could result in adverse crop response. This response will ultimately depend on initial **VANDAL 45C** application rate, application timing, amount, and pH of the irrigation water and the sensitivity of the crop and the growth stage when irrigated. The risk of adverse crop response will lessen with advancing growth stages of most crops.

The system must contain a functional check valve, vacuum relief valve, and low-pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow. The pesticide injection pipeline must also contain a functional, automatic, quick closing check valve to prevent the flow of fluid back toward the injection pump. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.

Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

VANDAL 45C should be metered into the irrigation system continuously for the duration of the water application. **VANDAL 45C** should be diluted in sufficient volume to insure accurate application over the area to be treated. Use the appropriate amount of water to carry the product to the soil surface. Continuous agitation is required to maintain product suspension in the solution tank. A jar test should be conducted to ensure that phase separation would not occur during dilution and application. Failure to achieve a uniform dilution throughout the time of application may result in undesirable residues or less than desirable weed control. Flush the lines at the completion of the application and then turn the water off promptly.

When using water from public water systems DO NOT APPLY **VANDAL 45C** THROUGH ANY IRRIGATION SYSTEM **PHYSICALLY CONNECTED TO A PUBLIC WATER SYSTEM**. Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year. **VANDAL 45C** may be applied through irrigation systems which may be supplied by a public water system **only if** water from the water system is discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and to top of overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe. Before beginning chemigation always make sure that the air gap exists and that there is no blockage of the overflow of the reservoir tank.

Application with Dry Fertilizers

VANDAL 45C may be applied impregnated on dry fertilizers. When applied as directed with adequate soil coverage, **VANDAL 45C** dry bulk fertilizer mixtures will provide satisfactory weed control.

Follow all **VANDAL 45C** label directions regarding product use rates per acre, registered crops, incorporation, special instructions, and precautions.

Apply VANDAL 4SC/dry fertilizer mixtures with ground equipment only

All individual state regulations relating to dry bulk fertilizer blending, registration, labeling, and application are the responsibility of the individual and/or company preparing, storing, transporting, selling, or applying the VANDAL 4SC/dry fertilizer mixture.

Impregnation Directions

To impregnate VANDAL 4SC on dry bulk fertilizer use a closed rotary drum mixer or other commonly used dry bulk fertilizer blender equipped with suitable spray equipment. Prepare a slurry of VANDAL 4SC in a clean container using clear water. Slowly add the VANDAL 4SC/water slurry to the impregnation spray tank and finish filling as needed with clear water. Spray nozzles must be placed to provide uniform coverage of VANDAL 4SC onto the fertilizer during mixing.

Refer to the SPRAYER EQUIPMENT CLEAN OUT section for directions for cleaning impregnation equipment, transport equipment, loading equipment, and application equipment.

Apply the VANDAL 4SC dry bulk fertilizer with an accurately calibrated dry fertilizer spreader. The VANDAL 4SC dry bulk fertilizer mixture must be spread uniformly on the soil surface. Uneven spreading leaving untreated areas can cause poor weed control or overlapping areas with potential increased VANDAL 4SC use rates could result in possible crop response.

A minimum of 200 pounds of dry bulk fertilizer impregnated with the listed amount of VANDAL 4SC must be applied per acre to achieve adequate soil coverage for satisfactory weed control. DO NOT impregnate VANDAL 4SC onto coated ammonium nitrate or limestone because these materials will not absorb the herbicide.

Refer to the appropriate crop section of the VANDAL 4SC label to determine the rate of VANDAL 4SC to be applied per acre. Use the following table to determine the amount of VANDAL 4SC to be impregnated on a ton (2000 pounds) of dry bulk fertilizer based on the rate of fertilizer that will be applied per acre.

For those rates not listed in the following table calculate the amount of VANDAL 4SC to be impregnated on a ton of dry bulk fertilizer using the following formula:

$$\frac{2000}{\text{Pounds dry fertilizer per acre}} \times \text{VANDAL 4SC use rate in fluid ounces per acre} = \text{Ounces of VANDAL 4SC to be applied per ton of fertilizer}$$

RATE CHART FOR IMPREGNATION OF DRY BULK FERTILIZERS WITH VANDAL 4SC Table 2

Dry Fertilizer (lb/acre)	Ounces VANDAL 4SC per ton of fertilizer		
	VANDAL 4SC Use Rate Per Acre		
	8.0 Fluid Oz per Acre	10.1 Fluid Oz per Acre	12.0 Fluid Oz per Acre
200	80	101	120
250	64	80.8	96
300	53.3	67.3	80
350	45.7	57.7	68.6
400	40	50.5	60
450	35.6	44.9	53.3

Application with Liquid Fertilizer

VANDAL 4SC may be applied using liquid fertilizer solutions as the carrier. The fertilizer solutions may either be concentrate formulations as blended or diluted with water. When applied as directed with adequate soil coverage VANDAL 4SC applied with liquid fertilizer mixtures will provide satisfactory weed control. However, adequate soil coverage is essential to achieve acceptable levels of weed control.

Herbicide mixing, solution stability, and/or compatibility problems can occur when liquid fertilizers are used as a carrier. Compatibility tests must be conducted prior to mixing to insure tank mixture compatibility and stability. The use of compatibility agents may be beneficial to achieve and maintain a homogenous solution.

Mixing Instructions for Liquid Fertilizer Applications

Fill the clean spray tank to one half of the total volume with the fertilizer solution. Start the spray tank agitation system. Prepare a slurry of VANDAL 4SC in a clean container with clean water using equal volumes of VANDAL 4SC and clean water. Slowly add the VANDAL 4SC/water slurry to the spray tank. Carefully rinse the slurry container adding the rinse to the spray tank. Better mixing of the VANDAL 4SC/water slurry may be achieved if the slurry is added using induction systems on the sprayer fill plumbing system.

Complete filling the spray tank to the desired level. Sufficient and continuous spray tank agitation is required at all times to maintain a homogenous spray solution. The spray system must be designed such that there is sufficient flow capacity to uniformly apply the spray mixture and maintain adequate tank agitation. Some systems may require separate pumps to simultaneously supply the spray system and the spray tank agitation system. Insure the VANDAL 4SC slurry is thoroughly mixed before application.

For tank mixtures with other herbicides, a compatibility test must be conducted to insure product compatibility before mixing. Read and follow all the directions, precautions, and restrictions of the tank mixture products prior to mixing.

Apply the VANDAL 4SC spray mixture immediately after mixing. Do not store the sprayer overnight or for any extended period of time with the VANDAL 4SC spray mixture remaining in the tank.

Do not premix VANDAL 4SC spray solutions in nurse tanks.

Follow all VANDAL 4SC label directions regarding product use rates per acre, registered crops application instructions, incorporation directions, special instructions and all precautions.

All individual state regulations relating to liquid fertilizer blending, storage, transportation, registration, labeling, and application are the responsibility of the individual and/or company preparing selling or applying the VANDAL 4SC and fertilizer mixture.

SPRAY DRIFT REDUCTION ADVISORY

To avoid drift do not apply when wind speeds exceed 10 mph. Do not exceed spray pressures of 40 psi unless specified by the manufacturer of drift reducing spray tips and nozzles.

Spray Drift Management

AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR AND THE GROWER

The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when in making decisions.

The following drift management requirements must be followed to avoid off target movement from aerial applications. These requirements do not apply to forestry applications, public health uses, or to applications of dry materials.

1. The distance of the outermost nozzles on the boom must not exceed $\frac{3}{4}$ the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.
3. Observe the regulations of the State where applications are made.
4. Applications must observe and abide by the requirements of the Aerial Drift Reduction Advisory.

Information on Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage for pesticide performance. Applying larger droplets reduces drift potential but will not prevent drift if applications are made improperly or under unfavorable environmental conditions. (See information on Wind, Temperature and Humidity, and Temperature Inversions in subsequent sections).

Controlling Spray Droplet Size

Volume - Use high flow rate nozzles to apply the greatest practical spray volume. Nozzles with higher rated flow generally produce larger droplets.

Pressure - When higher flow rates are needed use higher flow rate nozzles rather than increasing spray pressure.

Do not exceed the nozzle manufacturer's recommended pressures. Lower pressure produces larger droplets in many types of nozzles.

Number of Nozzles - Use the minimum number of nozzles that provide uniform coverage

Nozzle Orientation - For aerial application the recommended practice is to orient nozzles so that the spray is released parallel to the airstream. This orientation usually produces larger droplets as compared to other nozzle orientations. Significant nozzle deflection from horizontal will reduce droplet size and increase drift potential.

Nozzle Type - Use a nozzle type that is designed for the intended application. With most nozzle types narrower spray angles produce larger droplets. Consider using low drift nozzles for both ground and aerial applications. Solid stream nozzles oriented straight back usually produce the largest droplets and the lowest drift potential in aerial applications.

Boom Length - For some aerial use patterns reducing the effective boom length to less than $\frac{3}{4}$ of the wingspan or rotor length may further reduce drift without reducing swath width

Application Height - Aerial applications should not be made at a height greater than 10 feet above the top of the target plant canopy unless a greater height is required for aircraft safety. In making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment - When aerial applications are made with a crosswind the swath will be displaced downwind. Therefore, on the upwind and downwind edges of the field the applicator must compensate for this displacement by the path of the aircraft upwind swath adjustment or offset distance should increase when conditions favor increased drift potential (higher winds smaller droplets etc.).

Wind - Drift potential is lowest between wind speeds of 3-10 mph. However, many factors including droplet size and equipment type determine drift potential at any given wind speed. Application should be avoided below 3 mph due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they may potentially affect spray drift.

Temperature and Humidity - When in making applications in low relative humidity set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions - Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the low speed and variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common during conditions of limited cloud cover and little to no wind. They often begin to form as the sun sets and may often continue into the morning. The presence of a temperature inversion may be indicated by ground fog. However, if fog is not present the movement of smoke from a ground source or an aircraft smoke generator can also identify inversions. Smoke that remains in layers and moves laterally in a concentrated cloud (under low speed wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas - The pesticide should only be applied when the wind is blowing away from sensitive areas (e.g. residential areas, bodies of water, known habitats for threatened or endangered species, non-target crops.)

Off Target Movement of VANDAL 45C

Drift of dilute spray mixtures containing VANDAL 45C must be prevented. Observation of the preceding environmental conditions, correct application equipment design, calibration and application practices will significantly diminish the risk of off target spray drift. VANDAL 45C can cause significant symptomatology by drift on to sensitive crops and other plants. This symptomatology may manifest initially as discreet, localized spots where contacted by VANDAL 45C drift mixtures. Depending on concentration of the spray solution and droplets size (effectively determining the dosage of Sulfentrazone) and also depending on the inherent sensitivity of the plants involved, these spots or lesions may or may not coalesce. These effects will usually not have lasting effects on plant growth, but will likely reduce the value of affected fruit or foliage where grade or quality is associated with appearance. In severe drift instances with particularly sensitive crops, defoliation of affected foliage could result. Failure to follow these guidelines and environmental prohibitions that then result in off-target movement or drift of VANDAL 45C on to unintended crops or plants, irrespective of severity, constitutes misapplication of this product. Invictis accepts no responsibility or liability for potential crop effects that may result from such misapplication of VANDAL 45C.

MAXIMUM ALLOWABLE VANDAL 4SC USE PER ACRE PER 12 MONTH PERIOD*

Refer to the crop section of this label for specific product use directions.

Table 3

Crop	Ounces VANDAL 4SC Per Acre	Pounds Active Sulfentrazone Per Acre
ROW CROPS		
Corn	12.0	0.375
Fallow	8.0	0.25
Peanuts	9.6	0.30
Potatoes	8.0	0.25
Soybeans	12.0	0.375
Sugarcane	12.0	0.375
Sunflower, subgroup 20B	8.0	0.25
Tobacco	12.0	0.375
Wheat, spring (Pacific Northwest states. ID, OR, WA only)	6.0	0.1875
VEGETABLE CROPS		
Asparagus	12.0	0.375
Brassica, head and stem (Broccoli and Cabbage)	12.0	0.375
Brassica, leafy greens	6.4	0.220
Cowpeas, succulent (Tennessee only)	6.0	0.1875
Dry Beans & Peas	8.0	0.25
Fruiting Vegetables and Okra (except cucurbits)	12.0	0.375
Horseradish	8.0	0.25
Lima beans, Succulent (Tennessee only)	6.0	0.1875
Melons	8.0	0.25
Rhubarb	8.0	0.25
Strawberry	12.0	0.375
Succulent Peas	6.0	0.1875
Turnips	8.0	0.25
OIL CROPS		
Flax	12.0	0.375
Mint	12.0	0.375
TURF		
Sod Production	12.0	0.375
PERMANENT CROPS		
Berries	12.0	0.375
Citrus	12.0	0.375
Grapes	12.0	0.375
Tree Nuts	12.0	0.375

*The total allowed usage per twelve month period includes all applications made to the field per twelve month interval. This includes fallow treatments, burndown treatments, planting time, and all in season treatments. The twelve month period is considered to begin upon the initial VANDAL 4SC application.

CROP ROTATIONAL RESTRICTIONS

The following table 4 shows the minimum interval in months from the time of the last VANDAL 4SC application until VANDAL 4SC treated soil can be replanted to the crops listed. When VANDAL 4SC is tank mixed with another herbicide, refer to the partner label for recropping instructions, following the directions that are most restrictive.

For all other crops not listed below, the rotational interval is a minimum of 12 months. Some crops have rotational intervals greater than 12 months after a VANDAL 4SC application due to potential crop injury. A representative bioassay of the field shall be completed with the rotational crop to accurately determine the planned crop's sensitivity to Sulfentrazone.

CROP ROTATIONAL RESTRICTIONS**

Table 4

Crop	Interval (Months)
Alfalfa	12
Asparagus	Anytime
Barley	4
Berries	Anytime
Brassica, head and stem (Broccoli and Cabbage)	Anytime

Crop	Interval (Months)
Brassica, leafy green	Anytime
Canola	24
Cereal Grains (Buckwheat, Oats, Pearl Millet, Proso Millet, Teosinte, Wild Rice)	12
Citrus	Anytime
Corn, Field	10
Corn, Pop	18
Corn, Sweet	18
Cotton	18
Cowpea, succulent (Tennessee only)	Anytime
Dry Sell Peas and Beans	Anytime
Flax	Anytime
Fruiting Vegetables (Except cucurbits)	Anytime
Grapes	Anytime
Horseradish	Anytime
Lima beans, succulent (Tennessee only)	Anytime
Melons	Anytime
Mint	Anytime
Peanuts	Anytime
Potatoes	Anytime
Rhubarb	Anytime
Rice	10
Rye	4
Sorghum	10*
Soybeans	Anytime
Strawberry	Anytime
Succulent peas	Anytime
Sugar Beets	36
Sugarcane	Anytime
Sunflower, subgroup 20B	Anytime
Sweet Potatoes	12
Triticale	4
Tobacco	Anytime
Tree Nuts	Anytime
Turf	Anytime
Turnips	Anytime
Wheat	4
Wheat, spring (Pacific Northwest States, ID, OR, WA only)	Anytime

* Sorghum – 18 month rotation for rates above 8.0 oz./acre

For all other crops not listed, the rotation interval is a minimum of 12 months

BAND TREATMENT APPLICATIONS

For band treatments, apply the broadcast equivalent rate and volume per acre. To determine these

$$\frac{\text{Band Width (Inches)}}{\text{Row Width (Inches)}} \times \text{Broadcast Rate Per Acre} = \text{Band Rate}$$

$$\frac{\text{Band Width (Inches)}}{\text{Row Width (Inches)}} \times \text{Broadcast Volume Per Acre} = \text{Band Volume}$$

MIXING AND LOADING INSTRUCTIONS

VANDAL 45C may be applied alone or in tank mixtures with other herbicides for the control of additional weed species. Mixtures with some other pesticides have not been tested. Conduct appropriate compatibility tests prior to tank mixing with other pesticides. Follow all precautions and restrictions on the tank mix partner label. It is important that spray equipment is clean and free of existing pesticide residues before preparing **VANDAL 45C** spray mixtures. Follow the spray tank clean out procedures specified on the label of the product or products previously applied.

For best results fill spray tank with one half of the volume of clean water needed for the field to be treated. Start agitation system. Prepare a slurry of **VANDAL 45C** in a clean container using clean water. Slowly add the **VANDAL 45C**/water slurry to the spray tank. Carefully rinse the slurry container adding the rinsate to the spray tank. Complete filling the spray tank to the desired level. Continuous spray tank agitation is required at all times to maintain a uniform spray solution. Make sure **VANDAL 45C** is thoroughly mixed before application or before adding another product to the spray tank.

Use the **VANDAL 45C** spray mixture immediately after mixing. Do not store the sprayer overnight or for any extended period of time with the **VANDAL 45C** spray mixture remaining in the tank. Do not premix **VANDAL 45C** spray solutions in nurse tanks.

If **VANDAL 45C** is tank mixed with other herbicides, all additional directions, restrictions, and precautions for the tank mixture herbicides must be followed.

SPRAYER EQUIPMENT CLEAN-OUT

As soon as possible after spraying VANDAL 45C and before using sprayer equipment for any other applications, the sprayer must be thoroughly cleaned to avoid potential crop effects using the following procedure. Residues left in mixing equipment, spray tanks, hoses, spray booms, and nozzles can cause crop effects if they are not properly cleaned. In addition users must take in steps to ensure proper equipment clean out for any other products mixed with VANDAL 45C as required on the other product labels. More complete cleaning can be achieved if the spray system is cleaned immediately following the application.

1. Drain sprayer tank, hoses, spray boom, and spray nozzles. Use a high pressure detergent wash to remove physical sediment and residues from the inside of the sprayer tank and thoroughly rinse. Then thoroughly flush sprayer hoses, spray boom, and spray nozzles with a clean water rinse. Remove and clean spray tips and all filters and screens (tank, spray hose, and spray tips) separately in the ammonia solution of Step 2.
2. Next prepare a sprayer cleaning solution by adding three gallons of ammonia (containing at least 3% active) per 100 gallons of clean water. Prepare sufficient cleaning solution to allow the operation of the spray system for a minimum of 15 minutes to thoroughly flush hoses, spray boom, and spray nozzles.
3. Convenient and thorough cleaning of the sprayer can be achieved if the ammonia solution or fresh water is left in the spray tank, hoses, spray booms, and spray nozzles overnight or during storage.
4. Before using the sprayer, completely drain the sprayer system. Rinse the tank with clean water and flush through the hoses, spray boom, and spray nozzles with clean water. Remove and clean spray tips and all filters and screens (tank, spray hose, and spray tip) separately in an ammonia solution.
5. Properly dispose of all cleaning solution and rinsate in accordance with Federal, State, and local regulations and guidelines.

Do not apply sprayer cleaning solutions or rinsate to sensitive crops.

Do not store the sprayer overnight or for any extended period of time with **VANDAL 45C** spray solution remaining in the tank, spray lines, spray boom, plumbing, spray nozzles, or strainers. If the sprayer has been stored or idle, purge the spray boom and nozzles with clean water before beginning any application.

Should small quantities of **VANDAL 45C** remain in inadequately cleaned mixing, loading, and/or spray equipment, they may be released during subsequent applications potentially causing effects to certain crops and other vegetation. Invictus Crop Care, LLC accepts no liability for any effects due to inadequately cleaned equipment.

Do not drain of flush equipment on or near desirable trees or plants.

Do not contaminate any body of water including irrigation water that may be used on other crops.

WEEDS LIST

When **VANDAL 45C** is applied in accordance with the Application information and the specific crop use directions, **VANDAL 45C** applied alone or in listed tank mixtures will provide control of the following weeds. Refer to the specific crop section.

Table 5

COMMON NAME	SCIENTIFIC NAME
Amaranth, livid	<i>Amaranthus lividus</i>
Amaranth, Palmer	<i>Amaranthus palmeri</i>
Amaranth, Powell	<i>Amaranthus Powellii</i>
Amaranth, spiny	<i>Amaranthus spinosus</i>
Amaranth, spleen	<i>Amaranthus dubius</i>
Anoda, spurred	<i>Anoda cristata</i>
Bedstraw, catchweed	<i>Galium aparine</i>
Carpetweed	<i>Mollugo verticillata</i>
Chickweed, common	<i>Stellaria media</i>
Copperleaf, hophornbeam	<i>Acalypha ostryeifolia</i>
Copperleaf, Virginia	<i>Acalypha virginica</i>
Crabgrass, large	<i>Digitaria sanguinalis</i>
Crabgrass, smooth	<i>Digitaria ischaemum</i>
Crabgrass, Southern	<i>Digitaria ciliaris</i>
Croton, tropic	<i>Croton glandulosus</i>
Crownbeard, golden	<i>Verbesia encelioides</i>
Cupgrass, woolly	<i>Eriochloa villosa</i>
Cyperus, hedgehog	<i>Cyperus compressus</i>
Daisy, American	<i>Eclipta alba</i>
Devilsclaw	<i>Proboscidea louisiana</i>
Dock, curly	<i>Rumex crispus</i>
Eclipta	<i>Eclipta prostrata</i>
Filaree, redstem	<i>Erodium cicutarium</i>

COMMON NAME	SCIENTIFIC NAME
Flaxweed	<i>Descurainia sophia</i>
Galinsoga, hairy	<i>Galinsoga ciliata</i>
Goosegrass	<i>Elyusine indica</i>
Groundcherry, clammy (seedling)	<i>Physalis heterophylla</i>
Groundcherry, cutleaf	<i>Physalis angulata</i>
Jimsonweed	<i>Datura stramonium</i>
Kochia (ALS and Triazine Resistant)	<i>Kochia scoparia</i>
Ladysthumb	<i>Polygonum persicaria</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lettuce, miners	<i>Montia perfoliata</i>
Mallow, common	<i>Malva neglecta wall. r.</i>
Mayweed, Chamomile	<i>Anthemis cotula l</i>
Milkweed, honeyvine	<i>Ampelamus albidus</i>
Morningglory, entireleaf	<i>Ipomoea hederacea integruscula</i>
Morningglory, ivyleaf	<i>Ipomoea hederacea hederacea</i>
Morningglory, palmleaf	<i>Ipomoea wrightii</i>
Morningglory, purple	<i>Ipomoea turbinata</i>
Morningglory, red	<i>Ipomoea coccinea L.</i>
Morningglory, scarlet	<i>Ipomoea coccinea</i>
Morningglory, smallflower	<i>Jacquemontia tamnifolia</i>
Morningglory, tall	<i>Ipomoea purpurea</i>
Mustard, tumble	<i>Sisymbrium alissimum</i>
Nightshade, black	<i>Solanum nigrum</i>
Nightshade, Eastern black	<i>Solanum ptycanthum</i>
Nutsedge, purple	<i>Cyperus rotundus</i>
Nutsedge, yellow	<i>Cyperus esculentus</i>
Orchardgrass	<i>Dactylis glomerata</i>
Panicum, fall	<i>Panicum dichotomiflorum</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Plantain, blackseed	<i>Plantago rugelii decne</i>
Plantain, narrow leaved	<i>Plantago lanceolata</i>
Poorjoe	<i>Diodia teres</i>
Porophyllum	<i>Porophyllum rederale</i>
Poinsettia, wild	<i>Euphorbia heterophylla</i>
Purslane, common	<i>Portulaca oleracea</i>
Redmaids	<i>Calandrinia ciliata</i>
Redweed	<i>Melochia corchorifolia</i>
Sedge, annual	<i>Carex spp.</i>
Senna, coffee	<i>Cassia occidentalis</i>
Shepherdspurse	<i>Capsella bursa pastoris</i>
Sida, prickly	<i>Sida spinosa</i>
Sida, Southern	<i>Sida acuta</i>
Signalgrass, broadleaf	<i>Brachiana platyphylla</i>
Smartweed, PA (seedling)	<i>Polygonum pensylvanicum</i>
Smellmellon	<i>Cucumis melo</i>
Starbur, bristly	<i>Acanthospermum hispidum</i>
Stinkgrass	<i>Eragrostis ciliarensis</i>
Toadflax, yellow	<i>Linana vulgaris</i>
Tassleflower, red	<i>Emilio sonchifolia</i>
Thistle, Russian	<i>Salsola kali</i>
Waterhemp, common	<i>Amaranthus rudis</i>

COMMON NAME	SCIENTIFIC NAME
Waterhemp, tall	<i>Amaranthus tuberculatus</i>
Waterprimrose, winged	<i>Ludwigia decurrens</i>
Witchgrass	<i>Panicum capillare</i>

REPLANTING INSTRUCTIONS

If initial planting of labeled crops fails to produce a stand, only labeled crops for **VANDAL 4SC** or the tank mix partner, whichever is most restrictive may be planted. Do not retreat field with **VANDAL 4SC** or other herbicide containing Sulfentrazone. Do not plant treated fields with any crop at intervals that are inconsistent with the Rotational Crop Guidelines on this label. When replanting use minimum soil tillage to preserve the herbicide barrier and achieve maximum weed control.

ROW CROPS

CORN (Field Corn, Seed Corn, Popcorn) (For Use Only with GMO Varieties (Roundup-Ready, Liberty-Link, or other glyphosate and/or glufosinate-tolerant varieties) Tolerant to PPO Herbicides)

Table 6

VANDAL 4SC Use Rate Table (Corn)				
Fall, Spring Early Preplant, Preemergence, and Preplant Incorporated Applications				
Broadcast Rate	Fluid Ounces VANDAL 4SC per acre			
	Soil Texture			
% Organic Matter	Coarse	Medium	Fine	
<1.5	3.0 – 4.5	3.0 – 4.5	3.75 – 5.25	
1.5 – 3.0	3.0 – 4.5	3.75 – 6.0	4.5 – 6.75	
>3.0	3.75 – 6.0	4.5 – 6.75	6.0 – 8.0	

Refer to the previous information on soil types under the coarse, medium, and fine categories.
Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Preplant (Fall Applications)

VANDAL 4SC may be applied in the fall as a preplant treatment prior to corn planting the following spring.

VANDAL 4SC can be used alone or in a tank mixture with other herbicides to control susceptible broadleaves, sedges, and grasses in corn. Apply **VANDAL 4SC** in conventional tillage or conservation tillage (reduced tillage or no tillage) cropping systems using rates listed in the Table 6. **VANDAL 4SC** should be applied to the stubble or soil surface and allow moisture from rainfall or snow to move the product into the soil. Do not mechanically incorporate in the fall or spring as this operation can destroy the herbicide barrier allowing weed escapes to occur. Do not apply to frozen soils or existing snow cover to prevent **VANDAL 4SC** runoff from rain or snowmelt that may occur following application. **VANDAL 4SC** may be tank mixed with other burndown herbicides to control emerged weeds in the fall or residual soil herbicides that are labeled for fall use on corn. Select the correct **VANDAL 4SC** use rate for corn from the Table 6 for your soil type and organic matter. Due to the extended period of time between the fall application and corn planting the use rate of **VANDAL 4SC** should be the mid to high rate within the rate range for the in soil type and organic matter.

Early Preplant and Preemergence (Spring Applications)

VANDAL 4SC may be applied preplant on the soil surface in the spring to control weeds in conventional and conservation tillage systems. **VANDAL 4SC** can be applied from 45 days prior to planting until 3 days after planting as a preemergence, broadcast, or banded soil application if corn seedlings have not broken the soil surface and if the seed furrow is completely closed. For preemergence applications, 14 to 45 days prior to planting, use the mid to high rate in the rate range for the soil and organic matter type listed in Table 6. **VANDAL 4SC** can be tank mixed with other herbicides labeled for use in corn. To control insect pests such as cutworm or armyworm that may be present, **VANDAL 4SC** may be tank mixed with insecticides including Mustang In ax or Capture 2EC. If dry conditions persist following preemergence application of **VANDAL 4SC**, a shallow incorporation may be needed to activate the herbicide. If weeds are emerged at the time of **VANDAL 4SC** application, use a burndown herbicide in conjunction with **VANDAL 4SC** as needed. When planting into soil treated preplant with **VANDAL 4SC**, minimize soil disturbance to maintain the herbicide barrier on the soil surface to achieve maximum weed control.

Preplant Incorporated

VANDAL 4SC may be applied as a Preplant Incorporated treatment in the spring prior to planting in reduced and conventional tillage corn. **VANDAL 4SC** should be shallowly incorporated or mixed thoroughly into the soil to a maximum depth of 2 inches using a correctly adjusted implement such as a field cultivator, field finisher, or disk harrow. Incorporating **VANDAL 4SC** deeper than 2 inches may result in inconsistent weed control. Use the in rate from Table 6 for the soil texture, organic matter, and pH level of the soil. **VANDAL 4SC** can be tank mixed with other soil applied herbicides and insecticides labeled for preplant incorporation in corn. **VANDAL 4SC** may be applied more than once to the same crop in split or sequential applications to provide season long control of difficult to control existing or late emerging weeds.

Precautions

These Crop Specific Use directions are based upon the interactive effects of **VANDAL 4SC** (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, **VANDAL 4SC** Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with **VANDAL 4SC**. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on **VANDAL 4SC** under specific local conditions.

Restrictions

Do not apply more than 12.0 fluid ounces (0.375 pound active) per twelve month period. The twelve month period is considered to begin upon the initial **VANDAL 4SC** application.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not apply to frozen soils or existing snow cover to prevent **VANDAL 4SC** runoff from rain or snowmelt that may occur following application.

FALLOW OR POST HARVEST BURNDOWN

VANDAL 45C may be applied in the fall following crop harvest or in existing fallow fields of asparagus, cabbage, corn, dry shell peas and beans, horseradish, Lima, mint, peanuts, potatoes, soybeans, sugarcane, sunflowers, and tobacco.

Table 7

VANDAL 45C Use Rate Table (Fallow or Post Harvest Burndown)			
Fall and Spring Fallow Applications			
Broadcast Rate	Fluid Ounces <i>VANDAL 45C</i> per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	3.0 – 3.75	3.0 – 4.5	3.75 – 5.25
1.5 – 3.0	3.75 – 5.25	3.75 – 6.0	4.5 – 6.75
>3.0	4.5 – 6.0	4.5 – 8.0	5.25 – 8.0

Refer to the previous information on soil types under the coarse, medium, and fine categories.
Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Fall Application (MN, ND, SD, MT, CO, NE, WY, ID, WA, OR, WI, MI)

VANDAL 45C may be applied in the fall following crop harvest or in existing fallow fields to control or suppress weeds the following season. The *VANDAL 45C* Rotational Crop Guidelines in Table 4 must be followed if crops are planted the next season. *VANDAL 45C* should be applied to the harvested crop stubble or soil surface without incorporation. Moisture in the form of rain or snow will move and activate the product. Do not mechanically incorporate in the fall or spring after application because this activity may destroy the herbicide barrier and weed escapes can occur. Do not apply to frozen soils to prevent *VANDAL 45C* runoff from rain or snow that may occur following application. *VANDAL 45C* may be tank mixed with herbicides to control emerged weeds. Sequential applications may be needed depending on weed size. In situations where weed size may interfere with *VANDAL 45C* reaching the soil surface, a separate burndown application prior to the application of *VANDAL 45C* will be required. Use listed rates of burndown herbicides in combination with *VANDAL 45C* or sequential applications as needed. Higher aerial spray volumes are required when there is a dense weed population or canopy. *VANDAL 45C* can be tank mixed with other herbicides.

Spring Preemergence Application

VANDAL 45C may be applied as a fallow treatment early in the spring provided the application is made prior to weed emergence and adequate moisture is available to activate the *VANDAL 45C*. Follow the same use rate recommendations and application guidelines listed under the Fall Application section above.

Weeds Controlled

When applied according to directions *VANDAL 45C* will provide control of

Filaree redstem	Pigweed, redroot
Kochia (ALS and Triazine Resistant)	Pigweed, smooth
Lambsquarters, common	Thistle, Russian
Morningglory, ivyleaf	Waterhemp, common
Morningglory, tall	Waterhemp, tall
Nightshade, Eastern Black	

For information on other weeds not listed above, refer to Weeds Controlled section of this label.

Precautions

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 45C* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, *VANDAL 45C* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 45C*. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 45C* under specific local conditions.

Restrictions

Do not apply more than 8.0 fluid ounces (0.25 lb active) per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 45C* application.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not apply to frozen soils or existing snow cover to prevent *VANDAL 45C* runoff from rain or snowmelt that may occur following application.

PEANUTS

Southeastern United States Only (AL, GA, MS, NC, SC VA)

Apply *VANDAL 45C* alone or in combination with other registered herbicides for the control of key grass and broadleaf weeds in peanut production. Refer to the information below for specific use directions. *VANDAL 45C* is registered for use on peanuts only in the following states, AL, GA, MS, NC, SC, and VA.

Application Instructions

VANDAL 45C may be preplant incorporated (to a depth no greater than 2 inches) up to 14 days prior to planting. Alternatively, *VANDAL 45C* may be applied to the soil surface at planting or within 12 hours after planting. Incorporation of *VANDAL 45C* deeper than 2 inches can result in adverse crop response and/or inconsistent weed control. Do not use *VANDAL 45C* for at crack type applications or apply to exposed peanut tissue. Such use can result in significant adverse crop response. For optimum performance, a combination of *VANDAL 45C* plus a grass herbicide labeled for peanuts is recommended. Under conditions of exceptionally high weed populations, or when weeds not controlled by *VANDAL 45C* are anticipated, the use of suitable post emergent peanut herbicides is recommended. Broadcast apply the correct *VANDAL 45C* use rate from the tables below in a minimum of 10 gallons of water per acre of finished spray. Banded *VANDAL 45C* application rates must be adjusted in proportion to the broadcast rate.

VANDAL 45C Use Rates and Weeds Controlled in coarse Soils ¹

When applied as directed at 4.8 fluid ounces (0.15 pound active ingredient) per acre VANDAL 45C will provide Control of the listed weeds.

Amaranth, spleen	Jimsonweed
Copperleaf, hophornbeam	Lambsquarters, common
Croton, tropic	Morningglory, entireleaf
Crownbeard, golden	Morningglory, red
Devilsclaw	

When applied as directed at 6.4 fluid ounces (0.2 pound active ingredient) per acre VANDAL 45C will provide Control of the listed weeds

All the weeds controlled at 4.8 fl. oz. Plus	
Amaranthus, Palmer	Morningglory, smallflower
Crabgrass, large	Poinsettia, wild ²
Crabgrass, Southern	Redweed
Eclipta	Senna, coffee
Goosegrass	Signalgrass, broadleaf
Morningglory, pitted	Smartweed, PA (seedling)

When applied as directed at 8.0 fluid ounces (0.25 pound active ingredient) per acre VANDAL 45C will provide Control of the listed weeds

All the weeds controlled at 6.4 fl. oz. Plus	
Anoda, spurred	Purslane, common
Cocklebur, common	Sida, prickly
Nutsedge, yellow	Starbur, prickly
Nutsedge, purple ³	

¹ Use rates are *VANDAL 45C* fluid ounces per acre. Specified weeds are controlled in coarse (sand and loamy sand) soils, Medium and fine soils (sandy loam, clay loam, clay), or soils with organic matter greater than 1.0% should use the next higher rate in the table above. The next higher rate for 8.0 fluid ounces (0.25 lb. a.i.) should not exceed 9.6 fluid ounces (0.3 lb. a.i.) per acre.

² Controls initial and several continuing flushes (germinations) of wild poinsettia.

³ Purple Nutsedge activity is based on preplant incorporated applications of *VANDAL 45C*. Pre emergence surface applications may provide control (>85%) under certain circumstances. Otherwise, purple Nutsedge will be partially controlled (71 to 84%).

In soils with pH greater than 7 use the next lower *VANDAL 45C* application rate. Irrigation with alkaline (pH 8 to 9) water can result in adverse crop response. The extent of crop response is dependent on *VANDAL 45C* application rate, soil type (including %OM and pH), timing (after *VANDAL 45C* application relative to crop emergence), amount, and pH of irrigation water. Do not irrigate with water greater than pH 9.

After peanuts are established (4 to 6 across in size) the alkalinity of irrigation water has minimal impact on crop growth.

For information on other weeds not listed above, refer to Weeds Controlled section (Table 5) in this label.

Precautions

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 45C* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, *VANDAL 45C* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weeds Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 45C*. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 45C* under specific local conditions.

Restrictions

Do not apply more than 9.6 fluid ounces (0.3 lb. a.i.) of *VANDAL 45C* per acre per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 45C* application.

Do not feed treated peanut forage or peanut hay to livestock.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not irrigate with water having a pH higher than 9.

Do not apply at cracking time.

POTATOES

Table 8

VANDAL 45C Use Rate Table (Potatoes)			
Preemergence Application			
Broadcast Rate	Fluid Ounces <i>VANDAL 45C</i> per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	3.0 – 4.5	3.0 – 4.5	3.75 – 5.25
1.5 – 3.0	3.0 – 4.5	3.75 – 6.0	4.5 – 6.0
>3.0	4.5 – 6.0	5.25 – 6.75	6.0 – 8.0

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Ground and Aerial Applications

Apply **VANDAL 45C** by aerial application as a preemergence treatment following planting and after dragoff, but prior to potato emergence. Optimum performance can be achieved if **VANDAL 45C** is applied to the soil surface and either rainfall or overhead irrigation is used to activate the product. If no moisture is received within 7 days following application in areas without irrigation, a shallow incorporation (less than 2 inches) may be needed prior to weed and potato emergence to activate the product. Select the in use rate based on soil texture and organic matter as shown in Table 8 above. For control of emerged weeds at the time of the **VANDAL 45C** application, an appropriate burndown herbicide, and adjuvants labeled for potatoes may be tank mixed with **VANDAL 45C** to control these weeds. Do not apply **VANDAL 45C** if the potatoes have emerged from the soil as undesirable crop response may occur. **VANDAL 45C** may be tank mixed with other soil applied herbicides labeled for use in potatoes to improve weed management and increase weed control spectrum.

Apply **VANDAL 45C** in a minimum of 10 gallons of spray by ground application and 5 gallons of spray by air.

Chemigation Applications

VANDAL 45C may be applied to potatoes through sprinkler irrigation systems including center pivot, lateral move, end tow, solid set, or hand move irrigation systems. Apply **VANDAL 45C** prior to potato emergence using sufficient water (0.25 to 0.5 inch per acre) to provide thorough soil surface coverage, but to avoid runoff of irrigation water. **VANDAL 45C** may be applied with other products labeled for chemigation use in potatoes.

It is important to note that irrigation with highly alkaline water (high pH) following a **VANDAL 45C** soil application may significantly increase the amount of Sulfentrazone available in soil solution. Irrigation with water having a pH greater than 7.5 could result in adverse crop response. This response will ultimately depend on initial **VANDAL 45C** application rate, application timing, amount, and pH of irrigation water the sensitivity of the crop and the crop growth stage when irrigated. The risk of adverse crop response will lessen with advances in the crop growth stage.

Weeds Controlled when applied according to Directions. **VANDAL 45C** will provide control of

Amaranth, Palmer	Nightshade, Eastern black
Filaree, redstem	Pigweed, redroot
Kochia (ALS and Triazine Resistant)	Pigweed, smooth
Lambsquarters, common	Thistle, Russian
Morningglory, ivyleaf	Waterhemp, common
Morningglory, tall	Waterhemp, tall

For information on other weeds not listed above, refer to Weeds Controlled section (Table 5) in this label.

Precautions

Potato varieties may vary in their response to herbicide applications. When using **VANDAL 45C** on an untested variety, always determine the crop tolerance before planting. Some potato varieties including Sangre, Shepody, and Snowden have shown sensitivity to **VANDAL 45C**. Caution should be used when planting these varieties on marginal coarse soils.

These Crop Specific Use directions are based upon the interactive effects of **VANDAL 45C** (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions. **VANDAL 45C** Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with **VANDAL 45C**. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on **VANDAL 45C** under specific local conditions.

Restrictions

Do not use on soils classified as sand which have less than 1% organic matter.

Do not apply **VANDAL 45C** after potato emergence from the soil as undesirable crop response may occur.

Do not apply more than 8.0 fluid ounces (0.25 pound active) per acre per twelve month period. The twelve month period is considered to begin upon the initial **VANDAL 45C** application.

SOYBEANS

Table 9

VANDAL 45C Use Rate Table (Soybeans)				
Fall, Spring Early Preplant, Preemergence, and Preplant Incorporated Application				
Broadcast Rate	Fluid Ounces VANDAL 45C per acre			
	Soil Texture			
% Organic Matter	Coarse	Medium	Fine	
<1.5	4.5 – 6.0	6.0 – 8.0		
1.5 – 3.0	6.0 – 8.0	8.0 – 10.1		
>3.0	8.0 – 10.1	10.1 – 12.0		

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Ground and Aerial Applications

Apply **VANDAL 45C** in conventional tillage, conservation tillage, reduced tillage, or no tillage cropping systems using rates listed in the **VANDAL 45C** Use Rate Table 9. **VANDAL 45C** may be applied with ground or aerial sprayers calibrated to deliver a minimum of 10 gallons of finished spray by ground application and 5 gallons of finished spray by air. Use nozzle types and arrangements that will provide optimum coverage while producing a minimal amount of fine droplets. Apply sufficient spray volume to achieve adequate coverage.

Preplant Incorporated and Preemergence Applications

VANDAL 45C can be applied prior to planting or up to 3 days after planting. When applications after planting are delayed greater than 3 days after planting, injury may occur if seeds are germinating. **VANDAL 45C** may be applied preemergence or preplant incorporated. For preplant incorporated applications, incorporation must be uniform and no deeper than 2 inches. Improper soil incorporation may result in erratic weed control and/or crop injury. **VANDAL 45C** applied near or after crop emergence may cause severe injury to the crop. **VANDAL 45C** can be applied alone or in combination with other labeled soybean herbicides. **VANDAL 45C** may be followed by labeled postemergence soybean herbicides for increased control of grass and broadleaf weeds. Always follow the most restrictive label when tank mixing. When using **VANDAL 45C** in no till or minimum till cropping systems, tank mix with an appropriate burndown herbicide for improved control of existing weeds.

Fall Applications

VANDAL 45C may be applied as a fall treatment to the stubble of harvested crops for the burndown of existing vegetation and preemergence control of labeled weeds the following spring in no till and conservation tillage production systems. Fall applications of *VANDAL 45C* must be made in weed control programs that include as needed spring applications of preplant preemergence or postemergence herbicides for the following crop season. *VANDAL 45C* can be applied to the stubble of a harvested crop in no till or to the soil surface of conservation tillage fields after harvest when the sustained soil temperature is 55 degrees F and falling at a soil depth of 4 inches. Apply after September 30 in those areas North of Interstate 90 and after October 15 in those areas North of Interstate 70. Do not apply *VANDAL 45C* as a fall treatment South of Interstate 70. Applications to ridge till production systems must be made after the formation of ridges or bedded.

If weeds are emerged at the time of application, utilize a tank mixture with a suitable burndown herbicide at labeled rates. Fall applied burndown treatments should be made with a minimum of 20 gallons per acre to achieve adequate coverage of the weeds being treated. When making burndown applications to emerged weeds, the addition of adjuvants such as COC or MSO to the spray mixture can be used to enhance the burndown activity of the application.

Weeds Controlled

When Applied according to directions *VANDAL 45C* will provide control of

Amaranth, Palmer	Nightshade
Copperleaf, hophornbeam	Pigweed, spp.
Kochia (ALS and Triazine Resistant)	Sida, prickly
Lambsquarters, common	Thistle, Russian
Morningglory, spp.	Waterhemp, spp.

For information on other weeds not listed above, refer to Weeds Controlled section (Table 5) in this label.

Precautions

When applying *VANDAL 45C* with other registered herbicides, refer to specific label information on precautions, instructions, limitations, application methods and timings, and weeds controlled.

VANDAL 45C is especially effective against a wide range of economic broadleaf and grass weeds. The same processes that Sulfentrazone affects in these weeds can, under certain conditions, be affected in soybeans. These conditions include high pH (7.5 and above), cool weather, prolonged and excessive moisture, seedling diseases, and any other condition, including poor agronomic practices, that are unfavorable to vigorous crop growth. Such effects in soybeans are often observed as stunting and discoloration. The duration of these effects are somewhat dependent on the duration of the adverse growing conditions. These effects lessen and generally diminish with the return to normal growing conditions.

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 45C* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions. *VANDAL 45C* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 45C*. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 45C* under specific local conditions.

Restrictions

Do not apply more than 12.0 fluid ounces (0.375 lbs. active) per acre of *VANDAL 45C* per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 45C* application.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not apply to frozen soils or existing snow cover to prevent *VANDAL 45C* runoff from rain or snowmelt that may occur following application.

Do not apply after crop seed germination

SUGARCANE

Table 10

VANDAL 45C Use Rate Table (Sugarcane)

Planting Time and Lay by Applications

Broadcast Rate	Fluid Ounces <i>VANDAL 45C</i> per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	4.5 – 6.0	6.0 – 8.0	8.0
1.5 – 3.0	6.0 – 8.0	8.0 – 10.1	10.1
>3.0	8.0 – 10.1	10.1 – 12.0	12.0

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Apply *VANDAL 45C* as a broadcast or banded preemerge soil applied treatment for the control of broadleaf weeds grasses and sedges in sugarcane. Refer to the *VANDAL 45C* Product Use Rate Section and Table 10 for specific use information.

Planting Time Applications

Apply *VANDAL 45C* preemerge to newly planted or ratoon sugarcane. Use the higher rate on clay soils and/or soils with organic matter content higher than 2 percent. Apply either by air in a minimum of 5 gallons of spray per acre or by ground equipment in a minimum of 15 gallons of spray per acre. *VANDAL 45C* may be applied with other herbicides registered for use in sugarcane.

Aerial Applications

VANDAL 45C may be applied by air in a minimum of 5 gallons of finished spray per acre. *VANDAL 45C* may be applied with other herbicides or insecticides registered for aerial application in sugarcane.

Lay by Applications

Apply *VANDAL 45C* as a directed spray to sugarcane at lay by timing. Use the higher rate on clay soils and/or soils with organic matter content higher than 2 percent. Apply as a directed spray with ground equipment in a minimum of 15 gallons of spray per acre. *VANDAL 45C* may be applied with other herbicides registered for use in sugarcane.

Weeds Controlled**When applied according to directions VANDAL 45C will provide control of**

Morningglory, entireleaf	Morningglory, tall
Morningglory, ivyleaf	Pigweed, red root
Morningglory, red	Nutsedge, yellow

For information on other weeds not listed above, refer to Weeds Controlled section (Table 5) in this label.

Precautions

These Crop Specific Use directions are based upon the interactive effects of **VANDAL 45C** (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, **VANDAL 45C** Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with **VANDAL 45C**. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on **VANDAL 45C** under specific local conditions.

Restrictions

Pre harvest Interval (PHI) Do not apply within 120 days of harvest.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not allow spray to contact crop leaves.

Do not apply more than 12.0 fluid ounces (0.375 lbs. active) per acre of **VANDAL 45C** per acre per twelve month period. The twelve month period is considered to begin upon the initial **VANDAL 45C** application.**SUNFLOWER SUBGROUP 20B**

Cenelunda, CasTor oil plant, Chinese tallowtree, Euphorbia, Evening primrose, Joboba, Niger seed, Rose hip, Safflower, Stokes aster, Sunflower, Tallowwood, Tea oil plant, Vernonia, cultivars, varieties, and/or hybrids of these.

Table 11

VANDAL 45C Use Rate Table (Sunflower subgroup 20B)				
Fall, Early Spring Preplant, Preemergence, and Preplant Incorporated Applications				
Broadcast Rate	Fluid Ounces VANDAL 45C per acre			
		Soil Texture		
% Organic Matter	Coarse	Medium	Fine	
<1.5	3.0 – 3.75	3.0 – 4.5	3.75 – 5.25	
1.5 – 3.0	3.0 – 4.5	3.75 – 6.0	4.5 – 6.75	
>3.0	3.75 – 6.0	4.5 – 6.75	6.0 – 8.0	

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Fall Applications (For use only in ND, SD, MT, MN, WY, CO, NE, KS)

VANDAL 45C may be applied in the fall as a preplant treatment to control or suppress weeds prior to planting the following spring. **VANDAL 45C** should be applied to the stubble or soil surface and allow moisture from rainfall or snow to move the product into the soil. Do not mechanically incorporate in the fall or spring as this can destroy the herbicide barrier and allowing weed escapes to occur. Do not apply to frozen soils or to existing snow cover to prevent **VANDAL 45C** runoff from rain or snow melt that may occur following application. **VANDAL 45C** may be tank mixed with other residual soil herbicides that are labeled for fall use on sunflowers or other crops in subgroup 20B. If weeds are emerged at the time of **VANDAL 45C** application, use a burndown herbicide such as glyphosate or paraquat at the full labeled rate in combination with **VANDAL 45C** or split application as needed. Select the appropriate rate from Table 11 above within the correct soil type and organic matter range. When applying **VANDAL 45C** in the fall, use a mid to high rate within the rate range for the appropriate soil type and organic matter.

Early Preplant and Preemergence (Spring Applications)

VANDAL 45C may be applied preplant on the soil surface in the spring to control weeds. **VANDAL 45C** can be applied early preplant prior to planting, up to 3 days after planting as a preemergence soil application if seedlings have not broken the soil surface, and if the seed furrow is completely closed. For preemergence applications greater than 3 weeks prior to planting, use the high rate within the appropriate rate range for the soil and organic matter type listed in the use rate chart above (Table 13). If applying **VANDAL 45C** to coarse textured soils with less than 1.5% organic matter, wait a minimum of 7 days after application before planting. **VANDAL 45C** can be tank mixed with other preemergence herbicides labeled for sunflowers or other crops in subgroup 20B. If dry conditions persist following preemergence application of **VANDAL 45C**, a shallow incorporation may be needed to incorporate and activate the herbicide. If weeds are emerged at the time of **VANDAL 45C** application, use a burndown herbicide at the full labeled rate in combination with **VANDAL 45C** or split application as needed.

Preplant Incorporated (PPI)

VANDAL 45C may be applied as a Preplant Incorporated treatment in the spring prior to planting in reduced and conventional tillage. **VANDAL 45C** should be shallowly incorporated in the soil no deeper than 2 inches. Incorporating **VANDAL 45C** deeper than 2 inches can result in inconsistent weed control. Use the in rate from Table 11 above for the soil texture organic matter and pH level. **VANDAL 45C** can be tank mixed with other soil applied herbicides labeled for preplant incorporation in sunflowers or other crops in subgroup 20B.

Weeds Controlled**When applied according to directions, VANDAL 45C will provide control of**

Amaranth, Palmer	Pigweed, red root
Filaree, redstem	Pigweed, smooth
Kochia (ALS and Triazine Resistant)	Sida, Prickly
Lambsquarters, common	Thistle, Russian
Morningglory, ivyleaf	Waterhemp, common
Morningglory, tall	Waterhemp, tall
Nightshade, Eastern black	

For information on other weeds not listed above refer to Weeds Controlled section (Table 5) in this label.

Precautions

When applying **VANDAL 45C** to coarse textured soils it is recommended that growers allow a minimum of 7-14 days from application to planting. Best results are achieved with **VANDAL 45C** when applications are made early preplant and greater than 14 days before planting.

Some adverse crop response may occur on coarse textured soils with low organic matter (less than 1.5%) and pH of 7.8 or higher, or on highly eroded soils, or in areas of calcareous outcroppings. **VANDAL 45C** use rates should be reduced in those areas. Inadequate seed furrow closure or shallow planting (less than 1.0 inch) may result in undesirable crop response. As expected, poor growing conditions such as excessive moisture, low temperatures, soil compaction, and diseases may also cause undesirable crop response.

These Crop Specific Use directions are based upon the interactive effects of **VANDAL 45C** (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, **VANDAL 45C** Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with **VANDAL 45C**. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on **VANDAL 45C** under specific local conditions.

Restrictions

Do not apply more than 8.0 fluid ounces (0.25 pound active) of **VANDAL 45C** per twelve month period to sunflowers. The twelve month period is considered to begin upon the initial **VANDAL 45C** application.

Do not apply to frozen soils or existing snow cover to prevent **VANDAL 45C** runoff from rain or snowmelt that may occur following application.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not incorporate greater than 2 inches deep.

TOBACCO (Burley, Flue Cured and Dark)

Table 12

VANDAL 45C Use Rate Table (Tobacco)			
Preemergence and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces VANDAL 45C per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	4.5 – 6.0	6.0 – 8.0	8.0
1.5 – 3.0	6.0 – 8.0	8.0 – 10.1	10.1
>3.0	8.0 – 10.1	10.1 – 12.0	12.0

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

VANDAL 45C may be surface applied or preplant incorporated (to a depth no greater than 2 inches) from 14 days to 12 hours days prior to transplanting tobacco. Incorporating **VANDAL 45C** deeper than 2 inches can result in inconsistent weed control.

Broadcast apply the appropriate **VANDAL 45C** rate from Table 12 above in a minimum of 10 gallons per acre of water to the soil prior to transplanting.

Non Bedded (Fields where raised beds are NOT formed prior to transplanting)

Perform all accepted cultural practices for land preparation, fertilizer /fungicide incorporation, etc., prior to the application of **VANDAL 45C**. Once the field has been prepared for planting, **VANDAL 45C** may be surface applied or lightly preplant incorporated from 14 days to 12 hours prior to transplanting.

If **VANDAL 45C** is surface applied and it is necessary to remove equipment tracks from the field after application, but prior to transplanting, any light finishing equipment may be used providing the soil is not disturbed to a depth greater than 2 inches.

If timely cultivations are not performed following a pre-transplant surface application, reduced/unacceptable weed control may occur in the drill.

Bedded (Fields where raised beds ARE formed PRIOR to transplanting)

Apply **VANDAL 45C** to formed beds as a surface application from 14 days to 12 hours prior to transplanting. If it is customary to drag/knock down beds prior to transplanting, this procedure must be performed prior to the **VANDAL 45C** application.

When incorporating prior to bedding, **VANDAL 45C** must be thoroughly and uniformly incorporated to a depth no greater than 2 inches to avoid concentrating **VANDAL 45C** in the bed.

If initial transplanting fails to produce a uniform stand, tobacco may be replanted. DO NOT re-treat field with a second application of **VANDAL 45C** or any other herbicide containing Sulfentrazone. DO NOT re-bed. Re-transplant into previously formed treated beds. For broad spectrum and optimum grass weed control a grass herbicide application will be required.

Weeds Controlled

When Applied according to directions, **VANDAL 45C** will provide control of

Amaranthus, livid	Pigweed, redroot
Filaree, redstem	Pigweed, smooth
Galinsoga, hairy	Sida, prickly
Lambsquarters, common	Signalgrass, broadleaf
Morningglory, ivyleaf	Smartweed, Pennsylvania
Morningglory, tail	

For information on other weeds not listed above refer to Weeds Controlled section (Table 5) in this label.

Precautions

Poor agronomic practices, unfavorable pH soils, diseases, cold weather, excessive moisture, drought, or other conditions, unfavorable to normal plant growth, may adversely affect the growth of tobacco transplants. Weakened transplants may be more susceptible to herbicide response and diseases, particularly under poor drainage or compacted soil conditions or when the soil has been saturated for long periods of time. Contact your State Agricultural Extension Service Specialist for consultation as to the agronomic recommendations suited for your tobacco varieties and local conditions. Temporary stunting of tobacco may occur if transplants are set too shallowly or if heavy rainfall occurs immediately following transplanting. Splashing of treated soil onto tobacco leaves may cause some localized and inconsequential necrosis. Use sound transplanting practices that insure treated soil will not wash or crust over tobacco plants.

These Crop Specific Use directions are based upon the interactive effects of **VANDAL 43C** (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, **VANDAL 43C** Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with **VANDAL 43C**. Consult University or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on **VANDAL 43C** under specific local conditions.

Restrictions

Do not use on Shade Grown Tobacco.

Do not apply VANDAL 43C to soils classified as sands containing less than 1% organic matter.

Do not use **VANDAL 43C** in tobacco seedling beds or greenhouses.

Do not apply **VANDAL 43C** post transplant as unacceptable injury may occur.

Do not perform tillage practices that concentrate **VANDAL 43C** into the bed or crop injury may occur.

Do not apply more than 12.0 fluid ounces (0.375 lbs. active) per acre of **VANDAL 43C** per acre per twelve month period. The twelve month period is considered to begin upon the initial **VANDAL 43C** application.

Do not incorporate greater than 2 inches deep.

VEGETABLE CROPS

Before applying **VANDAL 43C** to vegetable crops users, producers and/or applicators must read and follow the information presented in the Conditions of Sale and Limitation of Warranty and Liability section on page 37 of this label.

ASPARAGUS

Table 13

VANDAL 43C Use Rate Table (Asparagus)				
Spring, Preemergence Applications				
Broadcast Rate	Fluid Ounces VANDAL 43C per acre			
	Soil Texture			
% Organic Matter	Coarse	Medium	Fine	
<1.5	4.5 – 6.0	6.0 – 8.0	8.0	
1.5 – 3.0	6.0 – 8.0	8.0 – 10.1	10.1	
>3.0	8.0 – 10.1	10.1 – 12.0	12.0	

Refer to the previous information on soil types under the coarse, medium, and fine categories.
Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Apply **VANDAL 43C** as a broadcast treatment to crowns established for one or more years

Apply in the spring before the crop and weeds emerge. **VANDAL 43C** should be applied at 4.5 to 12 fluid ounces (0.141 to 0.375 pound active) per acre in 10 to 40 gallons of finished spray per acre. **VANDAL 43C** may be applied with other pesticides registered for use with asparagus.

Weeds Controlled

When applied according to directions **VANDAL 43C** will provide control of

Amaranth, Palmer	Nightshade, Eastern black
Galinsoga, hairy	Nutsedge, yellow
Lambsquarters, common	Pigweed, redroot
Morningglory, ivyleaf	Pigweed, smooth

For information on other weeds not listed above, refer to Weeds Controlled section (Table 5) in this label.

Precautions

These Crop Specific Use directions are based upon the interactive effects of **VANDAL 43C** (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, **VANDAL 43C** Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with **VANDAL 43C**. Consult University or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on **VANDAL 43C** under specific local conditions.

Restrictions

Do not apply within 14 days prior to harvest.

Do not apply more than 12.0 fluid ounces (0.375 pound active) per acre per 12 month period.

Do not make more than one **VANDAL 43C** application per acre per 12 month period. The twelve month period is considered to begin upon the initial **VANDAL 43C** application.

Do not use on soils classified as sand which have less than 1% organic matter.

BRASSICA, HEAD AND STEM

Broccoli, Chinese broccoli, Brussels sprouts, Chinese (napa) cabbage, Chinese mustard, cauliflower, cavalo broccolo, kohlrabi

VANDAL 4SC Use Rate Table (Head and Stem Brassica)

Fall or Spring Early Preplant, Preemergence, and Preplant Incorporated Applications

Broadcast Rate	Fluid Ounces VANDAL 4SC per acre			
	Soil Texture			
% Organic Matter	Coarse	Medium	Fine	
<1.5	2.25 – 3.0	3.0 – 4.5	3.0 – 6.0	
1.5 – 3.0	3.0 – 6.0	6.0 – 9.0	6.0 – 9.0	
>3.0	6.0 – 9.0	6.0 – 12.0	6.0 – 12.0	

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Early Preplant and Preemergence (Fall Application or Spring Application)

VANDAL 4SC may be applied in the fall or spring preceding the growing season up to 72 hours prior to transplanting head and stem brassica. VANDAL 4SC should be applied to the harvested crop stubble or soil surface without incorporation. Moisture in the form of rain or snow will move and activate the product into the soil. Do not mechanically incorporate in the fall or spring after application as this may destroy the herbicide barrier and weed escapes can occur. Do not apply to frozen soils to prevent VANDAL 4SC runoff from rain or snow that may occur following application. VANDAL 4SC may be tank mixed with other burndown herbicides to control emerged weeds in the fall or spring or with residual soil herbicides that are labeled for use on head and stem brassica. Use the listed rates of burndown herbicides in combination with VANDAL 4SC or split applications as needed.

Preplant Incorporated (PPI)

VANDAL 4SC may be applied as a preplant incorporated treatment in the spring prior to transplanting head and stem brassica. Do not incorporate to depths greater than 2 inches. VANDAL 4SC can be tank mixed with other burndown or soil applied herbicides labeled for use in head and stem brassica. Use the listed rates of burndown herbicides or split applications as needed.

Weeds Controlled

When Applied according to directions, VANDAL 4SC will provide control of

Galinsoga, hairy	Waterhemp, common
Lambsquarters, common	Waterhemp, tall
Pigweed, redroot	

Precautions

These Crop Specific Use directions are based upon the interactive effects of VANDAL 4SC (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, VANDAL 4SC Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with VANDAL 4SC. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on VANDAL 4SC under specific local conditions.

Restrictions

Do not apply more than 12.0 ounces (0.375 pound active) per acre of VANDAL 4SC per application or per twelve month period. The twelve month period is considered to begin upon the initial VANDAL 4SC application.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not incorporate, to depths greater than 2 inches.

BRASSICA, LEAFY GREENS, Broccoli, Raab, Chinese (Bok choy) cabbage, Collards, Kale, Mizuna, Mustard greens, Mustard, Spinach, Rape greens

VANDAL 4SC Use Rate Table (Leafy Brassica)

Fall or Spring Early Preplant, Preemergence, and Preplant Incorporated Applications

Broadcast Rate	Fluid Ounces VANDAL 4SC per acre			
	Soil Texture			
% Organic Matter	Coarse	Medium	Fine	
<1.5	2.25 – 3.0	3.0 – 4.5	3.0 – 6.0	
1.5 – 3.0	3.0 – 6.0	6.0 – 6.4	6.0 – 6.4	
≥3.0	6.0 – 6.4	6.0 – 6.4	6.0 – 6.4	

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Early Preplant and Preemergence (Fall Application or Spring Application)

VANDAL 4SC may be applied in the fall or spring preceding the growing season up to 72 hours prior to planting leafy brassica. VANDAL 4SC should be applied to the harvested crop stubble or soil surface without incorporation. Moisture in the form of rain or snow will move and activate the product into the soil. Do not mechanically incorporate in the fall or spring after application as this may destroy the herbicide barrier and weed escapes can occur. Do not apply to frozen soils to prevent VANDAL 4SC runoff from rain or snow that may occur following application. VANDAL 4SC may be tank mixed with other burndown herbicides to control emerged weeds in the fall or spring or with residual soil herbicides that are labeled for use on cabbage. Use the listed rates of burndown herbicides in combination with VANDAL 4SC or split applications as needed.

Preplant Incorporated (PPI)

VANDAL 4SC may be applied as a preplant incorporated treatment in the spring prior to planting leafy brassica. Do not incorporate, to depths greater than 2 inches. VANDAL 4SC can be tank mixed with other burndown or soil applied herbicides labeled for use in leafy brassica. Use the listed rates of burndown herbicides or split applications as needed.

Weeds Controlled**When Applied according to directions, VANDAL 4SC will provide control of**

Galinsoga, hairy	Waterhemp, common
Lambsquarters, common	Waterhemp, tall
Pigweed, redroot	

Precautions

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 4SC* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, *VANDAL 4SC* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 4SC*. Consult University or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 4SC* under specific local conditions.

Restrictions

Do not apply more than 6.4 fluid ounces (0.20 pound active) per acre of *VANDAL 4SC* per application or per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 4SC* application.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not incorporate to depths greater than 2 inches.

CABBAGE (Transplanted Only)**Table 16**

VANDAL 4SC Use Rate Table (Cabbage)				
Fall or Spring Early Preplant, Preemergence, and Preplant Incorporated Applications				
Broadcast Rate	Fluid Ounces VANDAL 4SC per acre			
	Soil Texture			
% Organic Matter	Coarse	Medium	Fine	
<1.5	2.25 – 3.0	3.0 – 4.5	3.0 – 6.0	
1.5 – 3.0	3.0 – 6.0	6.0 – 9.0	6.0 – 9.0	
>3.0	6.0 – 9.0	6.0 – 12.0	6.0 – 12.0	

Refer to the previous information on soil types under the coarse, medium, and fine categories.
Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Early Preplant (Fall Application or Spring Application)

VANDAL 4SC may be applied in the states of MN, ND, SD, MT, CO, NE, WY, ID, WA, OR, WI, or MI only in the fall or spring preceding the growing season to control weeds prior to or up to the planting or transplanting of cabbage. *VANDAL 4SC* may be applied in the spring from 60 days prior to planting up to planting time. *VANDAL 4SC* should be applied to the harvested crop stubble or soil surface without incorporation. Moisture in the form of rain or snow will move and activate the product into the soil. Do not mechanically incorporate in the fall or spring after application as this may destroy the herbicide barrier and weed escapes can occur. Do not apply to frozen soils to prevent *VANDAL 4SC* runoff from rain or snow that may occur following application. *VANDAL 4SC* may be tank mixed with other burndown herbicides to control emerged weeds in the fall or spring or with residual soil herbicides that are labeled for fall use on cabbage. Use the listed rates of burndown herbicides in combination with *VANDAL 4SC* or split applications as needed.

Preplant Incorporated (PP)

VANDAL 4SC may be applied as a preplant incorporated treatment in the spring prior to transplanting of cabbage. Do not incorporate to depths greater than 2 inches. *VANDAL 4SC* can be tank mixed with other burndown or soil applied herbicides labeled for use in cabbage. Use the listed rates of burndown herbicides or split applications as needed.

Transplant Cabbage

VANDAL 4SC may be applied pre-emergence as a broadcast or banded treatment to transplanted cabbage only. Applications should be made broadcast or banded treatment prior to transplanting. *VANDAL 4SC* may be applied as a banded treatment into the row middles within 72 hours after transplanting.

Weeds Controlled**When Applied according to directions, VANDAL 4SC will provide control of**

Galinsoga, hairy	Waterhemp, common
Lambsquarters, common	Waterhemp, tall
Pigweed, redroot	

For information on other weeds not listed above refer to Weeds Controlled section (Table 5) in this label.

Precautions

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 4SC* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, *VANDAL 4SC* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 4SC*. Consult University or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 4SC* under specific local conditions.

Restrictions

Do not apply more than 12 fluid ounces (0.375 pound active) per acre of *VANDAL 4SC* per application or per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 4SC* application.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not incorporate to depths greater than 2 inches

DRY PEAS

Blackeyed pea, cowpea, crowder pea, southern pea, chickpea, pea (*Pisum*)(includes field pea) and pigeon pea.

Table 17

VANDAL 45C Use Rate Table (Dry Peas)			
Fall or Spring, Early Preplant, Preemergence, and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces VANDAL 45C per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	2.25 – 3.0	3.0 – 4.5	3.0 – 4.5
1.5 – 3.0	3.0 – 4.5	3.75 – 6.0	4.5 – 6.0
>3.0	3.75 – 6.0	4.5 – 6.75	5.25 – 8.0

Refer to the previous information on soil types under the coarse, medium, and fine categories.
Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Early Preplant and Fall Applications (For use only in ND, SD, MT, MN, WY, CO, NE, KS, WI, MI, OR, ID, WA, OR, MT) *VANDAL 45C* may be applied in the fall as a preplant treatment to control or suppress weeds prior to planting the following spring. *VANDAL 45C* should be applied to the stubble or soil surface and allow moisture from rainfall or snow to move the product into the soil. Do not mechanically incorporate in the fall or spring as this can destroy the herbicide barrier and weed escapes can occur. Do not apply to frozen soils or to existing snow cover to prevent *VANDAL 45C* runoff from rain or snow melt that may occur following application. *VANDAL 45C* may be tank mixed with other residual soil herbicides that are labeled for fall use on dry peas. If weeds are emerged at the time of *VANDAL 45C* application, use a burndown herbicide such as glyphosate or paraquat at the full labeled rate in combination with *VANDAL 45C* or split application as needed. Select the appropriate rate from Table 17 above within the correct soil type and organic matter range. When applying *VANDAL 45C* in the fall, use a mid to high rate within the rate range for the appropriate soil type and organic matter.

Early Preplant and Preemergence (Spring Applications)

VANDAL 45C may be applied preplant on the soil surface in the spring to control weeds in dry peas. *VANDAL 45C* can be applied early preplant prior to planting up to 3 days after planting as a preemergence soil application if seedlings have not broken the soil surface and if the seed furrow is completely closed. For preemergence applications greater than 3 weeks prior to planting, use the high rate within the appropriate rate range for the soil and organic matter type listed in the use rate chart above Table 17. If applying *VANDAL 45C* to coarse textured soils with less than 1.5% organic matter, wait a minimum of 7 days after application before planting. *VANDAL 45C* can be tank mixed with other preemergence herbicides labeled for dry peas use. If dry conditions persist following preemergence application of *VANDAL 45C* a shallow incorporation may be needed to incorporate and activate the herbicide. If weeds are emerged at the time of *VANDAL 45C* application, use a burndown herbicide at the full labeled rate in combination with *VANDAL 45C* or split application as needed.

Preplant Incorporated (PPI)

VANDAL 45C may be applied as a Preplant Incorporated treatment in the spring prior to planting in reduced and conventional tillage dry pea. Do not incorporate to depths greater than 2 inches. *VANDAL 45C* use rates for PPI applications are similar to those used in preplant and preemergence applications. *VANDAL 45C* can be tank mixed with other burndown or soil applied herbicides labeled for use in dry pea. Use the listed rates of burndown herbicides or split applications as needed.

Weeds Controlled

When applied according to directions, *VANDAL 45C* will provide control of:

Amaranth, Palmer	Pigweed, red root
Flaree, redstem	Pigweed, smooth
Kochia (ALS and Triazine Resistant)	Sida, prickly
Lambsquarters, common	Thistle, Russian
Morningglory, ivyleaf	Waterhemp, common
Morningglory, tall	Waterhemp, tall
Nightshade, Eastern black	

For information on other weeds not listed above refer to Weeds Controlled section (Table 5) in this label

Precautions

When applying *VANDAL 45C* to coarse textured soils it is recommended that growers allow a minimum of 7-14 days from application to planting. Best results are achieved with *VANDAL 45C* when applications are made early preplant and greater than 14 days before planting. Under extended periods of dry weather adequate weed control may not be achieved.

Some adverse crop response may occur on coarse textured soils with low organic matter (less than 1.5%) and pH of 7.8 or higher or on highly eroded soils or in areas of calcareous outcroppings. *VANDAL 45C* use rates should be reduced in those areas. Inadequate seed furrow closure or shallow planting (less than 1.0 inch) may result in undesirable crop response. As expected poor growing conditions such as excessive moisture, low temperatures, soil compaction, and diseases may also cause undesirable crop response.

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 45C* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions *VANDAL 45C* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 45C*. Consult University or extension weed management specialist for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 45C* under specific local conditions.

Restrictions

Do not apply more than 8.0 fluid ounces (0.25 pound active) total per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 45C* application.

Do not apply after crop emerges or if the seedling is close to the soil surface

Do not incorporate to depths greater than 2 inches

Do not apply to frozen soils or to existing snow cover to prevent *VANDAL 45C* runoff from rain or snow melt that may occur following application

Do not use on soils classified as sand which have less than 1% organic matter.

FRUITING VEGETABLES (EXCEPT CUCURBITS) AND OKRA

African eggplant, bush tomato, bell pepper, cocona, currant, tomato, eggplant, garden huckleberry, goji berry, groundcherry, martynia, naranjilla, okra, pea eggplant, pepino pepper, bell pepper, non-bell, roselle, scarlet eggplant, sunberry, tomatillo, tomato, tree tomato, cultivars, varieties, and/or hybrids of these.

Table 18

VANDAL 45C Use Rate Table (Fruiting Vegetables (Except Cucurbits) And Okra)				
Fall or Spring, Early Preplant, Preemergence, and Preplant Incorporated Applications				
Broadcast Rate	Fluid Ounces VANDAL 45C per acre			
	Soil Texture			
% Organic Matter	Coarse	Medium	Fine	
<1.5	2.25 – 3.0	3.0 – 4.5	3.0 – 6.0	
1.5 – 3.0	3.0 – 6.0	6.0 – 9.0	6.0 – 9.0	
>3.0	6.0 – 9.0	6.0 – 12.0	6.0 – 12.0	

Refer to the previous information on soil types under the coarse, medium, and fine categories.
Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Preplant Applications

VANDAL 45C may be applied preemergence as a broadcast or banded treatment on fruiting vegetables. Applications must be made prior to transplant. **VANDAL 45C** can be tank mixed with other burndown or soil applied herbicides labeled for use on tomatoes. Use the listed rates of burndown herbicides or split applications as needed. Observe all precautions, instructions, and rotational cropping guidelines of each products label when tank mixing including all references to potential carryover and crop injury, warnings, or restrictions.

Preplant Incorporated (PPI)

VANDAL 45C may be applied as a preplant incorporated treatment in the spring prior to transplanting tomatoes. Do not incorporate to depths greater than 2 inches. **VANDAL 45C** can be tank mixed with other burndown or soil applied herbicides labeled for use on tomatoes. Use the full recommended rates of burndown herbicides or split applications as needed.

Weeds Controlled

When Applied according to directions, **VANDAL 45C** will provide control of

Lambsquarters, common	Pigweed, redroot
Morningglory, ivyleaf	Waterhemp, common
Nutsedge, yellow	Waterhemp, tall

Precautions – These Crop Specific Use directions are based upon the interactive effects of **VANDAL 45C** (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions. **VANDAL 45C** Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with **VANDAL 45C**. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on **VANDAL 45C** under specific local conditions.

Restrictions

Do not apply more than 12.0 ounces (0.375 pound active) per acre of **VANDAL 45C** per application or per twelve month period. The twelve month period is considered to begin upon the initial **VANDAL 45C** application.

Do not use on soils classified as sand which have less than 1% organic matter.

HORSERADISH

Table 19

VANDAL 45C Use Rate Table (Horseradish)				
Fall or Spring, Early Preplant, Preemergence, and Preplant Incorporated Applications				
Broadcast Rate	Fluid Ounces VANDAL 45C per acre			
	Soil Texture			
% Organic Matter	Coarse	Medium	Fine	
<1.5	2.25 – 4.5	3.0 – 4.5	3.0 – 4.5	
1.5 – 3.0	4.5 – 6.0	6.0 – 8.0	6.0 – 8.0	
>3.0	6.0 – 7.5	6.0 – 8.0	6.0 – 8.0	

Refer to the previous information on soil types under the coarse, medium, and fine categories.
Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

VANDAL 45C may be applied as a preplant, preemergence, or preplant incorporated treatment by ground in a minimum of 15 gallons of finished spray.

Early Preplant (Fall Application or Spring Application) (MN, ND, SD, MT, CO, NE, WY, ID, WA, OR, WI, MI)

VANDAL 45C may be applied in the fall or spring preceding the growing season to control or suppress weeds prior to or up to the planting of horseradish. **VANDAL 45C** may be applied in the spring from 60 days prior to planting up to planting. **VANDAL 45C** should be applied to the harvested crop stubble or soil surface without incorporation. Moisture in the form of rain or snow will move and activate the product into the soil. Do not mechanically incorporate in the fall or spring after application as this may destroy the herbicide barrier and weed escapes may occur. Do not apply to frozen soils to prevent **VANDAL 45C** runoff from rain or snow that may occur following application. **VANDAL 45C** may be tank mixed with other burndown herbicides to control emerged weeds in the fall or spring or with residual soil herbicides that are labeled for use on horseradish. Use listed rates of burndown herbicides in combination with **VANDAL 45C** or split applications as needed.

Preplant Incorporated (PPI)

VANDAL 45C may be applied as a preplant incorporated treatment in the spring prior to planting of horseradish. Do not incorporate to depths greater than 2 inches. **VANDAL 45C** can be tank mixed with other burndown or soil applied herbicides labeled for use on horseradish. Use the listed rates of burndown herbicides or split applications as needed.

Pre Emergence (PRE)

VANDAL 45C may be applied pre-emergence as a broadcast or banded treatment on horseradish. Applications should be made broadcast prior to planting, broadcast soon after planting but at least 5 days before crop emergence. *VANDAL 45C* may be applied as a banded treatment into the row middles after crop emergence. Use the higher *VANDAL 45C* rates on clay soils and/or soils with greater than 1% organic matter. *VANDAL 45C* may be applied with other pesticides registered for use on horseradish.

Weeds Controlled

When applied according to directions, *VANDAL 45C* will provide control of:

Lambsquarters, common	Pigweed, redroot
Morningglory, ivyleaf	Waterhemp, common
Nutsedge, yellow	Waterhemp, tall

For information on other weeds not listed above refer to Weeds Controlled section (Table 5) in this label

Precautions

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 45C* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, *VANDAL 45C* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 45C*. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 45C* under specific local conditions.

Restrictions

Do not apply more than 8.0 fluid ounces (0.25 pound active) per acre of *VANDAL 45C* per application or per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 45C* application.

Do not apply directly on the crop after the crop emerges or if the seedling sprouts are close to the soil surface.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not incorporate to depths greater than 2 inches.

MELONS

Citron melon, muskmelon, watermelon

Table 20

***VANDAL 45C* Use Rate Table (Melons)**

Preemergence Applications

Broadcast Rate	Fluid Ounces <i>VANDAL 45C</i> per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	3.0 - 3.75	3.0 - 4.5	3.75 - 5.25
1.5 - 3.0	3.0 - 4.5	3.75 - 6.0	4.5 - 6.8
>3.0	3.75 - 6.0	4.5 - 6.8	6.0 - 8.0

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Preemergence

VANDAL 45C can be applied 48 hours prior to planting to anytime after planting but before seedlings have emerged. *VANDAL 45C* applied after crop emergence may cause severe injury to the crop. *VANDAL 45C* can be applied alone or in combination with other labeled melon herbicides. *VANDAL 45C* may be followed by labeled postemergence melon herbicides for increased control of grass and broadleaf weeds. Always follow the most restrictive label when tank mixing. When using *VANDAL 45C* in no till or minimum till cropping systems, tank mix with an appropriate burndown herbicide for improved control of existing weeds.

Weeds Controlled

When applied according to directions, *VANDAL 45C* will provide control of

Lambsquarters, common	Pigweed, redroot
Morningglory, ivyleaf	Waterhemp, common
Nutsedge, yellow	Waterhemp, tall

Precautions

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 45C* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, *VANDAL 45C* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 45C*. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 45C* under specific local conditions.

Restrictions

Do not apply more than 8.0 ounces (0.25 pound active) per acre of *VANDAL 45C* per application or per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 45C* application.

Do not apply directly on the crop after the crop emerges or if the seedling sprouts are close to the soil surface.

Do not use on soils classified as sand which have less than 1% organic matter.

STRAWBERRY

Table 21

VANDAL 4SC Use Rate Table (Strawberry)

Preemergence Applications

Broadcast Rate	Fluid Ounces VANDAL 4SC per acre			
	Soil Texture			
% Organic Matter	Coarse	Medium	Fine	
<1.5	2.25 – 3.0	3.0 – 4.5	3.0 – 6.0	
1.5 – 3.0	3.0 – 6.0	6.0 – 9.0	6.0 – 9.0	
>3.0	6.0 – 9.0	6.0 – 12.0	6.0 – 12.0	

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Preemergence

VANDAL 4SC can be applied prior to planting and before seedlings have emerged. VANDAL 4SC applied after crop emergence may cause severe injury to the crop. VANDAL 4SC can be applied alone or in combination with other labeled strawberry herbicides. VANDAL 4SC may be followed by labeled postemergence strawberry herbicides for increased control of grass and broadleaf weeds. Always follow the most restrictive label when tank mixing. When using VANDAL 4SC in no till or minimum till cropping systems, tank mix with an appropriate burndown herbicide for improved control of existing weeds.

Weeds Controlled

When applied according to directions, VANDAL 4SC will provide control of

Corn, spurry	Pineapple, weed
Field, Pansy	Prostrate, knotweed
Groundsel, common	Shepherdspurse
Ladysthumb	Waterhemp, common
Lambsquarters, common	Waterhemp, tall
Mayweed	White Camion
Morningglory, ivyleaf	Wild buckwheat
Nutsedge, yellow	Pigweed, redroot
Yellow woodsorrel	

Precautions

These Crop Specific Use directions are based upon the interactive effects of VANDAL 4SC (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, VANDAL 4SC Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with VANDAL 4SC. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on VANDAL 4SC under specific local conditions.

Restrictions

Do not apply more than 12.0 ounces (0.375 pound active) per acre of VANDAL 4SC per application or per twelve month period. The twelve month period is considered to begin upon the initial VANDAL 4SC application.

Do not apply directly on the crop after the crop emerges or if the seedling sprouts are close to the soil surface.

LIMA BEANS, SUCCULENT (TENNESSEE ONLY)

Table 22

VANDAL 4SC Use Rate Table (Lima Beans, Succulent (Tennessee Only))

Preemergence Applications

Broadcast Rate	Fluid Ounces VANDAL 4SC per acre			
	Soil Texture			
% Organic Matter	Coarse	Medium	Fine	
<1.5	2.25 – 3.75	3.0 – 6.0	3.75 – 6.0	
1.5 – 3.0	3.0 – 4.5	3.75 – 6.0	4.5 – 6.0	
>3.0	3.75 – 6.0	4.5 – 6.0	5.25 – 6.0	

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Preemergence (37.1)

VANDAL 4SC may be applied to succulent lima beans as a preemergence treatment at 6.0 fluid ounces (0.1875 pounds active) per acre. Applications should be made with ground equipment in a minimum of 10 gallons of finished spray per acre.

Weeds Controlled

When applied according to directions, *VANDAL 4SC* will provide control of

Copperleaf, hophornbeam	Pigweed, redroot
Morningglory, entireleaf	Pigweed, smooth
Morningglory, ivyleaf	
Ladythumb	Waterhemp, common

Precautions

When applying *VANDAL 4SC* to coarse textured soils it is recommended that growers allow a minimum of 7-14 days from application to planting. Best results are achieved with *VANDAL 4SC* when applications are made early preplant and greater than 14 days before planting.

Under extended periods of dry weather adequate weed control may not be achieved.

Some adverse crop response may occur on coarse textured soils with low organic matter (less than 1.5%) and pH of 7.8 or higher, or in highly eroded soils, or in areas of calcareous outcroppings. *VANDAL 4SC* use rates should be reduced in those areas. Inadequate seed furrow closure or shallow planting (less than 1.0 inch) may result in undesirable crop response. As expected, poor growing conditions such as excessive moisture, low temperatures, soil compaction, and diseases may also cause undesirable crop response.

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 4SC* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, *VANDAL 4SC* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 4SC*. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 4SC* under specific local conditions.

Restrictions

Do not apply more than 6 ounces (0.1875 pound active) per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 4SC* application.

Do not apply to coarse soils classified as sand which have less than 1% organic matter.

Do not incorporate.

COWPEAS, SUCCULENT (TENNESSEE ONLY)**Table 23**

<i>VANDAL 4SC</i> Use Rate Table (Cowpeas, Succulent (Tennessee Only))			
Preemergence Applications			
Broadcast Rate	Fluid Ounces <i>VANDAL 4SC</i> per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	2.25 – 3.75	3.0 – 6.0	3.75 – 6.0
1.5 – 3.0	3.0 – 4.5	3.75 – 6.0	4.5 – 6.0
>3.0	3.75 – 6.0	4.5 – 6.0	5.25 – 6.0

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Preemergence

VANDAL 4SC may be applied to succulent cowpeas as a preemergence treatment at 6.0 fluid ounces (0.1875 pounds active) per acre. Applications should be made with ground equipment in a minimum of 10 gallons of finished spray per acre.

Weeds Controlled

When applied according to directions, *VANDAL 4SC* will provide control of

Copperleaf, hophornbeam	Pigweed, redroot
Morningglory, entireleaf	Pigweed, smooth
Morningglory, ivyleaf	

Precautions

When applying *VANDAL 4SC* to coarse textured soils it is recommended that growers allow a minimum of 7-14 days from application to planting. Best results are achieved with *VANDAL 4SC* when applications are made early preplant and greater than 14 days before planting.

Under extended periods of dry weather adequate weed control may not be achieved.

Some adverse crop response may occur on coarse textured soils with low organic matter (less than 1.5%) and pH of 7.8 or higher, or in highly eroded soils, or in areas of calcareous outcroppings. *VANDAL 4SC* use rates should be reduced in those areas. If applying *VANDAL 4SC* to coarse textured soils with less than 1.5% organic matter, wait a minimum of 7 days after application before planting. Inadequate seed furrow closure or shallow planting (less than 1.0 inch) may result in undesirable crop response.

As expected, poor growing conditions such as excessive moisture, low temperatures, soil compaction, and diseases may also cause undesirable crop response.

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 4SC* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, *VANDAL 4SC* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 4SC*. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 4SC* under specific local conditions.

Restrictions

Do not apply more than 6 ounces (0.1875 pound active) per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 4SC* application.

Do not apply to coarse soils classified as sand which have less than 1% organic matter.

Do not incorporate.

SUCCULENT PEAS

Cajanus cajan (includes pigeon pea), *Cicer* spp. (includes chickpea and garbanzo bean), *Lens culinaris* (lentil), *Pisum* spp. (includes dwarf pea, garden pea, green pea, English pea, field pea, and edible pod pea)

Table 18**VANDAL 4SC Use Rate Table (Succulent Peas)**

Preemergence Applications

Broadcast Rate	Fluid Ounces <i>VANDAL 4SC</i> per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	2.25 – 3.75	3.0 – 6.0	3.75 – 6.0
1.5 – 3.0	3.0 – 4.5	3.75 – 6.0	4.5 – 6.0
>3.0	3.75 – 6.0	4.5 – 6.0	5.25 – 6.0

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Preemergence

VANDAL 4SC may be applied to succulent peas as a preemergence treatment at 6.0 fluid ounces (0.1875 pounds active) per acre. Applications should be made with ground equipment in a minimum of 10 gallons of finished spray per acre.

Weeds Controlled

When applied according to directions, *VANDAL 4SC* will provide control of:

Copperleaf, hophornbeam	Pigweed, redroot
Morningglory, entireleaf	Pigweed, smooth
Morningglory, ivyleaf	

Precautions

When applying *VANDAL 4SC* to coarse textured soils it is recommended that growers allow a minimum of 7-14 days from application to planting. Best results are achieved with *VANDAL 4SC* when applications are made early preplant and greater than 14 days before planting.

Under extended periods of dry weather adequate weed control may not be achieved.

Some adverse crop response may occur on coarse textured soils with low organic matter (less than 1.5%) and pH of 7.8 or higher, or on highly eroded soils, or in areas of calcareous outcroppings. *VANDAL 4SC* use rates should be reduced in those areas. If applying *VANDAL 4SC* to coarse textured soils with less than 1.5% organic matter, wait a minimum of 7 days after application before planting. Inadequate seed furrow closure or shallow planting (less than 1.0 inch) may result in undesirable crop response. As expected, poor growing conditions such as excessive moisture, low temperatures, soil compaction, and diseases may also cause undesirable crop response.

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 4SC* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions, *VANDAL 4SC* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 4SC*. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars or any other pertinent information on *VANDAL 4SC* under specific local conditions.

Restrictions

Do not apply more than 6 ounces (0.1875 pound active) per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 4SC* application.

Do not apply to coarse soils classified as sand which have less than 1% organic matter.

Do not incorporate.

OIL CROPS - FLAX**Table 23****VANDAL 4SC Use Rate Table (Flax)**

Fall, Early Preplant and Preemergence Applications

Broadcast Rate	Fluid Ounces <i>VANDAL 4SC</i> per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	2.25 – 3.0	3.0 – 4.5	3.0 – 6.0
1.5 – 3.0	3.0 – 6.0	6.0 – 9.0	6.0 – 9.0
>3.0	6.0 – 9.0	6.0 – 12.0	6.0 – 12.0

Refer to the previous information on soil types under the coarse, medium, and fine categories.

Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Fall Applications (For use only in ND, SD, MT, MN, WY, CO, NE, KS)

VANDAL 45C may be applied in the fall as a preplant treatment to control or suppress weeds prior to planting flax the following spring. *VANDAL 45C* should be applied to the stubble or soil surface and allow moisture from rainfall or snow to move the product into the soil. Do not mechanically incorporate in the fall or spring as this can destroy the herbicide barrier and allow weed escapes to occur. Do not apply to frozen soils or to existing snow cover to prevent *VANDAL 45C* runoff from rain or snow melt that may occur following application. If weeds are emerged at the time of *VANDAL 45C* application, use a labeled burndown herbicide at the full labeled rate in combination with *VANDAL 45C* or a sequential application as needed. Select the in rate from the Table above within the correct soil type and organic matter range. When applying *VANDAL 45C* in the fall use a mid to high rate within the rate range for the in soil type and organic matter.

Early Preplant and Preemergence (Spring Applications)

VANDAL 45C may be applied preplant on the soil surface in the spring to control weeds in flax. *VANDAL 45C* can be applied early preplant prior to planting up to 3 days after planting as a preemergence soil application if seedlings have not broken the soil surface and if the seed furrow is completely closed. *VANDAL 45C* applied after crop emergence may cause severe injury to the crop. For preemergence applications greater than 3 weeks prior to planting, use the mid to high rate within the appropriate rate range for the soil and organic matter type listed in the use rate chart above. *VANDAL 45C* can be applied alone or in combination with other labeled flax herbicides. Always follow the most restrictive label when tank mixing. *VANDAL 45C* may be followed by labeled postemergence flax herbicides for increased control of grass and broadleaf weeds. If dry conditions persist following preemergence application of *VANDAL 45C* weed control may be poor. If weeds are emerged at the time of *VANDAL 45C* application, use a burndown herbicide at the full labeled rate in combination with *VANDAL 45C* or split application as needed. When using *VANDAL 45C* in no till or minimum till cropping systems, tank mix with an appropriate burndown herbicide for improved control of existing weeds.

Preemergence

VANDAL 45C can be applied prior to planting to anytime after planting, but before seedlings have emerged. *VANDAL 45C* applied after crop emergence may cause severe injury to the crop. *VANDAL 45C* can be applied alone or in combination with other labeled flax herbicides. *VANDAL 45C* may be followed by labeled postemergence flax herbicides for increased control of grass and broadleaf weeds. Always follow the most restrictive label when tank mixing. When using *VANDAL 45C* in no till or minimum till cropping systems, tank mix with an appropriate burndown herbicide for improved control of existing weeds.

Weeds Controlled

When applied according to directions, *VANDAL 45C* will provide control of:

Copperleaf, hophornbeam	Morningglory, tall
Kochia (ALS and Triazine Resistant)	Nightshade, Eastern black
Morningglory, entireleaf	Pigweed, redroot
Morningglory, ivyleaf	Pigweed, smooth

Precautions

When applying *VANDAL 45C* to coarse textured soils, growers are to allow a minimum of 7-14 days from application to planting. Some adverse crop response may occur on coarse textured soils with low organic matter (less than 1.5%) and pH of 7.2 or higher or on highly eroded soils hilltops or in areas of calcareous outcroppings. *VANDAL 45C* use rates should be reduced to 3.0 oz./A in those areas or *VANDAL 45C* should not be used in those areas. Inadequate seed furrow closure or shallow planting (less than 1.0 inch) may result in undesirable crop response. As expected, poor growing conditions such as excessive moisture, low temperatures, soil compaction, and diseases may also cause undesirable crop response.

These Crop Specific Use directions are based upon the interactive effects of *VANDAL 45C* (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions. *VANDAL 45C* Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with *VANDAL 45C*. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on *VANDAL 45C* under specific local conditions.

Restrictions

Do not apply more than 12.0 ounces (0.375 pound active) per acre of *VANDAL 45C* per application or per twelve month period. The twelve month period is considered to begin upon the initial *VANDAL 45C* application.

Do not apply to frozen soils or existing snow cover to prevent *VANDAL 45C* runoff from rain or snowmelt that may occur following application.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not incorporate greater than 2 inches deep.

Do not apply directly on the crop after the crop emerges or if the seedling sprouts are close to the soil surface.

MINT**Table 24**

<i>VANDAL 45C</i> Use Rate Table (Mint)			
For Dormant and New Planting Applications			
Broadcast Rate	Fluid Ounces <i>VANDAL 45C</i> per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	4.5 – 6.0	6.0 – 8.0	8.0
1.5 – 3.0	6.0 – 8.0	8.0 – 10.1	10.1
>3.0	8.0 – 10.1	10.1 – 12.0	12.0

Refer to the previous information on soil types under the coarse, medium, and fine categories.
Use higher rates for soils of pH less than 7.0 and lower rates for pH greater than 7.0 within the rate range.

Dormant Applications

Apply *VANDAL 45C* to established stands of dormant mint after post harvest and/or spring land cultivation has been completed and before emergence of new mint growth.

Split applications of *VANDAL 45C* may be used for preemergence sequential control of winter annuals and summer annuals. Fall applications must be applied after post harvest cultivation has been completed and spring application made after spring cultivation has been completed and before emergence of new mint growth.

Apply **VANDAL 4SC** in tank mixtures with a registered burndown herbicide to control emerged weeds at the time of application. A surfactant is recommended with these tank mixtures to improve control of the emerged weeds.

VANDAL 4SC may also be applied in tank mixtures with other products registered for use in mint.

New Planting Applications

VANDAL 4SC may be applied to new mint plantings preemergence to the weeds and mint. The rate of application should be reduced approximately twenty five percent of the rate listed for established plantings for particular soil characteristics. Refer to **VANDAL 4SC** Use Rate Table (Table 24) for the in use rate for the soil type and organic matter content. The higher rates in the range are recommended for soils of pH less than 7.0.

Weeds Controlled

When Applied according to directions, **VANDAL 4SC** will provide control of:

Amaranth, Powell	Nutsedge, yellow
Bedstraw, catchweed	Pigweed, redroot
Chamomile, mayweed	Shepherdspurse
Kochia (ALS and Triazine Resistant)	Toadflax, yellow
Lambsquarters, common	Thistle, Russian
Morningglory, ivyleaf	Waterhemp, common
Nightshade, Eastern black	Waterhemp, tall

For information on other weeds not listed above refer to Weeds Controlled section (Table 5) in this label

Precautions

Applications made to mint that has emerged will result in severe injury to exposed plant tissue.

Apply only to healthy mint fields. Applications to mint under stress from disease, pests, and cultural or environmental conditions may result in crop injury.

Moisture in the form of rainfall or overhead irrigation is required after application to activate the herbicide

These Crop Specific Use directions are based upon the interactive effects of **VANDAL 4SC** (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Application Instructions. **VANDAL 4SC** Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Controlled, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with **VANDAL 4SC**. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on **VANDAL 4SC** under specific local conditions.

Restrictions

Apply **VANDAL 4SC** only to dormant mint or new mint plantings before new growth emerges.

Do not use on soils classified as sand which have less than 1% organic matter.

Do not apply more than 12 fluid ounces (0.375 pound active) per twelve month period. The twelve month period is considered to begin upon the initial **VANDAL 4SC** application.

PERMANENT CROPS

CITRUS FRUIT, TREE NUTS, GRAPES and BERRIES

Citrus Fruits (Crop Group 10) Australian desert lime, Australian finger lime, Australian round lime, Brown River finger lime, calamondin, citron, citrus hybrids, grapefruit, Japanese summer grapefruit, kumquat, lemon, lime, Mediterranean mandarin mount white lime, New Guinea wild lime, orange sour, orange sweet, pummelo, Russell River lime, satsuma mandarin, sweet lime, tachibana orange, Tahiti lime, tangelo, tangerine (mandarin), tangor trifoliolate orange, unqi fruit, cultivars, varieties, and/or hybrids of these.

Preharvest Interval 3 days

Grapes Wine, Raisin, Table and Juice, Amur river grape

Preharvest Interval 3 days

Berries (Crop Group 13 07) aronia berry, bayberry, bearberry, bilberry, blackberry (including Andean blackberry, arctic blackberry, bingleberry, black satin berry, boysenberry, brombeere, California blackberry, Chesterberry, Cherokee blackberry, Cheyenne blackberry, common blackberry, coryberry, darrowberry, dewberry, Dirksen thornless berry, evergreen blackberry, Himalayaberry, hullberry, lavacaberry, loganberry, lowberry, Lucretiaberry, maminolin blackberry, marionberry, mora, mures, deronce, nectarberry, Northern dewberry, ollaliberry, Oregon evergreen berry, phenomenalberry, rangeberry, ravenberry, roseberry, Shawnee blackberry, Southern dewberry, tayberry, youngberry, zarzamora, and cultivars, varieties, and/or hybrids of these) blueberry, highbush blueberry, lowbush, buffalo currant, buffaloberry, che, Chilean guava, chokecherry, cloudberry, cranberry, cranberry highbush, currant black, currant red, elderberry, European barberry, gooseberry, honeysuckle, edible huckleberry, jostaberry, Juneberry (Saskatoon berry), kiwifruit fuzzy, kiwifruit hardy, lingonberry, maypop, mountain pepper berries, mulberry varieties, native currant, partridgeberry, phalsa, pincherry, raspberry black and red, riberry, salal, schisandra berry, sea buckthorn, serviceberry, wild raspberry, cultivars, varieties, and/or hybrids of these.

Preharvest interval 3 days

Tree Nuts (Crop Group 14) Almond, Beech Nut, Brazil Nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (Hazelnut), Hickory Nut, Macadamia Nut (Bush Nut), Pecan, Pistachio, and Walnut (Black and English).

Preharvest Interval 3 days

APPLICATION INFORMATION

VANDAL 4SC should be applied as a uniform broadcast soil application to orchard and vineyard floors and to berry beds and furrows or as a uniform band application directed to the base of the trunk in trees and vines and to the base of the berry and beds in berry's to provide preemergence control of weeds in Table 23.

For best control, **VANDAL 4SC** should be applied when there are no weeds present or a postemergence herbicide is tank mixed to eliminate emerged weeds.

For broadcast applications, a single application of **VANDAL 4SC** should be made at 4 to 12 fl. oz. per acre (0.125 to 0.375 lb ai/A). Do not apply more than 12 fluid ounces (0.375 lb. a.i.) per acre per twelve month period. The twelve month period is considered to begin when the initial application of **VANDAL 4SC** is applied.

For improved weed management, **VANDAL 4SC** can be applied in a tank mixture with other preemergence and postemergence burndown herbicides. Refer to the tank mix partners labels for additional restrictions including minimum spray volumes and crops in which they are labeled. Burndown herbicides may include, but are not limited to, Aim, Shark, Rage, D Tech, glyphosate, paraquat, Rely, and 2,4-D. Do not tank mix with Chateau® herbicides (flumioxazin) or with other products containing Sulfentrazone.

When applied as a banded treatment, (50% band or less) refer to formula in chart below for rate and volume. **VANDAL 45C** may be applied twice per year. Do not apply more than 12 fl. oz. product per acre (0.375 lb ai/A) on a broadcast application basis per year. Allow a minimum of 60 days between applications unless otherwise specified on the label or separate published Invinctis Crop Care, LLC recommendations.

For band treatments apply the broadcast equivalent rate and volume per acre. To determine these:

$$\frac{\text{Band Width (Feet)}}{\text{Row Width (Feet)}} \times \text{Broadcast Rate Per Acre} = \text{Band Rate}$$

$$\frac{\text{Band Width (Feet)}}{\text{Row Width (Feet)}} \times \text{Broadcast Volume Per Acre} = \text{Band Volume}$$

A minimum of 10 gallons of spray solution per acre should be used to ensure uniform spray coverage, Nozzle selection should meet manufacturers spray volume and pressure recommendations for preemergence and postemergence herbicide applications. The spray solution should have a pH between 5.0 and 9.0.

VANDAL 45C should only be applied to crops that have been established for one full growing season and are in good health and vigor. Avoid contact of the spray solution on the green bark of trunks, of young vines, and trees by wrapping the trunk with a nonporous wrap, grow tubes, or wax containers which will keep the spray solution from coming in direct contact with the green tissue. Avoid direct or indirect spray contact with crop foliage and fruit.

Use ground equipment only do not apply using an airblast sprayer or by air.

Best results are obtained when the soil is moist at the time of application and the application will be followed by at least ½ inch of rainfall or sprinkler irrigation within two weeks after application. Applications should be timed to take advantage of normal rainfall patterns and cool temperatures, especially where drip or micro sprinkler irrigation is used which may not uniformly incorporate the herbicide.

WEED CONTROL INFORMATION

VANDAL 45C is a selective soil applied herbicide for the control of susceptible broadleaf grass and sedge weeds found in Tables 23 and 24. Adequate moisture of at least ½ inch is required within 14 days after application for optimal control. If adequate rainfall is not received in a timely fashion, irrigate with a minimum of ½ inch of water. When activating moisture is delayed, a reduced level of weed control may occur. These escaped weeds can be removed using a burndown herbicide.

Tank mix **VANDAL 45C** with a burndown herbicide and use an appropriate adjuvant when weeds are present at the time of application. Refer to the tank mix partners product label for the proper use rates by weed sizes. Use the most restrictive label limitations and precautions of the tank mix product(s).

Residual weed control may be reduced when **VANDAL 45C** is applied where heavy crop trash such as leaves and branches and/or weed residues exist. It is best to rake or blow off the leaves and trash when they fall and prior to the **VANDAL 45C** application.

Do not apply after petal fall unless using a hooded or shielded sprayer to ensure that the spray solution will not come in contact with the crop or foliage.

Permanent Crop Weed List

COMMON NAME	SCIENTIFIC NAME
Amaranth, livid	<i>Amaranthus lividus</i>
Amaranth, Palmer	<i>Amaranthus palmeri</i>
Amaranth, Powell	<i>Amaranthus Powell II</i>
Amaranth, spiny	<i>Amaranthus spinosus</i>
Amaranth, spleen	<i>Amaranthus dubius</i>
Anoda, spurred	<i>Anoda cristata</i>
Barnyardgrass, common	<i>Echinochloa crus-galli</i>
Bedstraw, catchweed	<i>Galium aparine</i>
Bindweed, field	<i>Convolvulus arvensis</i>
Bluegrass, annual	<i>Poa annua</i>
Bromegrass species	<i>Bromus</i> spp.
Burclover, California	<i>Medicago polymorpha</i>
Carpetweed	<i>Mollugo verticillata</i>
Cheatgrass	<i>Bromus tectorum</i>
Cheeseweed species	<i>Malva</i> spp.
Chickweed, common	<i>Stellaria media</i>
Clover species	<i>Trifolium</i> spp.
Copperleaf, hopfernbeam	<i>Acalypha ostryeafolia</i>
Copperleaf, Virginia	<i>Acalypha virginica</i>
Crabgrass, large	<i>Digitana sanguinalis</i>
Crabgrass, smooth	<i>Digitana ischaemum</i>
Crabgrass, Southern	<i>Digitana ciliaris</i>
Croton, tropic	<i>Croton glandulosus</i>
Crownbeard, golden	<i>Verbesina encelioides</i>
Cupgrass, woolly	<i>Enchloa villosa</i>
Cyperus, hedgehog	<i>Cyperus compressus</i>
Daisy, American	<i>Eclipta alba</i>

COMMON NAME	SCIENTIFIC NAME
Devilsclaw	<i>Proboscidea louisiana</i>
Dock, curly	<i>Rumex crispus</i>
Eclipta	<i>Eclipta prostrata</i>
Eveningprimrose, cutleaf	<i>Oenothera laciniata</i>
Fescue, Red	<i>Fetuca rubra</i>
Filaree, broadleaf	<i>Erodium botrys</i>
Filaree, redstem	<i>Erodium cicutarium</i>
Filaree, whitestem	<i>Erodium moschatum</i>
Fleabane, hairy	<i>Conyza bonariensis</i>
Flxweed	<i>Descurainia sophia</i>
Foxtail, bristly	<i>Setaria verticillata</i>
Foxtail, giant	<i>Setaria faberi</i>
Foxtail, green	<i>Setaria viridis</i>
Foxtail, yellow	<i>Setaria glauca</i>
Galinsoga, hairy	<i>Galinsoga ciliata</i>
Goosegrass	<i>Eleusine indica</i>
Goosefoot, nettleleaf	<i>Chenopodium murale</i>
Groundcherry, clammy (seedling)	<i>Physalis heterophylla</i>
Groundcherry, cutleaf	<i>Physalis angulate</i>
Groundsel, common	<i>Senecio vulgaris</i>
Henbit	<i>Lamium amplexicaule</i>
Horseweed (Marestail)	<i>Conyza Canadensis</i>
Ryegrass, Italian	<i>Lolium multiflorum</i>
Jimsonweed	<i>Datura stramonium</i>
Johnsongrass	<i>Sorghum halpense</i>
Junglerice	<i>Enchinochloa colona</i>
Knotweed, common	<i>Polygonum arenastrum</i>
Kochia (ALS and Triazine Resistant)	<i>Kochia scoparia</i>
Ladysthumb	<i>Polygonum persicaria</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lettuce, miners	<i>Montia perfoliata</i>
Lovegrass species	<i>Eragrostis</i> spp.
Mallow, common	<i>Malva neglecta wall r</i>
Mallow, little	<i>Malva parviflora</i>
Mayweed, Chamomile	<i>Anthemis cotula l</i>
Milkweed, honeyvine	<i>Ampelamus albidus</i>
Morningglory, entireleaf	<i>Ipomoea hederacea integruscula</i>
Morningglory, ivyleaf	<i>Ipomoea hederacea hederacea</i>
Morningglory, palmleaf	<i>Ipomoea wrightii</i>
Morningglory, purple	<i>Ipomoea turbinata</i>
Morningglory, red	<i>Ipomoea coccinea L</i>
Morningglory, scarlet	<i>Ipomoea coccinea</i>
Morningglory, smallflower	<i>Jacquemontia tamnifolia</i>
Morningglory, tall	<i>Ipomoea purpurea</i>
Mullein, turkey	<i>Eremocarpus setigerus</i>
Mustard, Species	<i>Brassica</i> spp.
Mustard, tumble	<i>Sisymbrium altissimum</i>
Nettle, burning	<i>Urtica urens</i>
Nightshade, black	<i>Solanum nigrum</i>
Nightshade, Eastern black	<i>Solanum ptycanthum</i>
Nutsedge, purple	<i>Cyperus rotundus</i>
Nutsedge, yellow	<i>Cyperus esculentus</i>

COMMON NAME	SCIENTIFIC NAME
Orchardgrass	<i>Dactylis glomerata</i>
Panicum, fall	<i>Panicum dichotomiflorum</i>
Pigweed, prostrate	<i>Amaranthus bioides</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Pigweed, Tumble	<i>Amaranthus albus</i>
Pineapple weed	<i>Chamomilla suaveolens</i>
Plantain, blackseed	<i>Plantago rugelii decne</i>
Plantain, narrow leaved	<i>Plantago lanceolata</i>
Poorjoe	<i>Diodia teres</i>
Porophyllum	<i>Porophyllum rederale</i>
Poinsettia, wild	<i>Euphorbia heterophylla</i>
Puncturevine	<i>Tribulus terrestris</i>
Purslane, common	<i>Portulaca oleracea</i>
Redmaids	<i>Calandrinia ciliata</i>
Redweed	<i>Melochia corchorifolia</i>
Radish, Wild	<i>Raphanus raphanistrum</i>
Rocket, London	<i>Sisymbrium ino</i>
Sandbur	<i>Cenchrus spinifer</i>
Sedge, annual	<i>Carex spp.</i>
Senna, coffee	<i>Cassia occidentalis</i>
Sheperdspurse	<i>Capsella bursa pastoris</i>
Sida, prickly	<i>Sida spinose</i>
Sida, Southern	<i>Sida acuta</i>
Signalgrass, broadleaf	<i>Bracharia platyphylla</i>
Smartweed, PA (Seedling)	<i>Polygonum pensylvanicum</i>
Smellmellon	<i>Cucumis melo</i>
Sowthistle species	<i>Sonchus spp.</i>
Strangletop, red	<i>Leptochloa filiformis</i>
Spurge, spotted	<i>Chamaesyce maculate</i>
Starbur, bristly	<i>Acanthospermum hispidum</i>
Stinkgrass	<i>Eragrostis cilianensis</i>
Toadflax, yellow	<i>Linaria vulgaris</i>
Tassleflower, red	<i>Emilio sonchifolia</i>
Thistle, Russian	<i>Salsola kali</i>
Waterhemp, common	<i>Amaranthus rudis</i>
Waterhemp, tall	<i>Amaranthus tuberculatos</i>
Waterprimrose, winged	<i>Ludwigia decurrens</i>
Willowleaf, panicle leaf	<i>Epilobium brachycarpum</i>
Witchgrass	<i>Panicum capillare</i>

ANNUAL AND PERENNIAL SEDGE CONTROL INCLUDING NUTSEdge

VANDAL 4SC applied at 12 fluid ounces per acre (0.375 lb ai/A) may provide control or suppression of sedges whether applied preemergence or postemergence to the sedges. Postemergence applications to sedges allow **VANDAL 4SC** to be taken into the sedge through the foliage as well as soil uptake through the roots. Soil uptake is the major means of uptake by sedges. Good spray coverage is required for optimum control of sedges, especially when applying postemergence to the sedges. Use a quality nonionic surfactant (NIC) at the rate of 0.25% v/v when applying postemergence.

When applied as directed **VANDAL 4SC** will provide control or suppression of the following sedges

COMMON NAME	SCIENTIFIC NAME
Kyllinga, green	<i>Kyllinga brevifolia</i>
Kyllinga, false green	<i>Kyllinga gracillima</i>
Nutsedge, purple	<i>Cyperus rotundus</i>
Nutsedge, yellow	<i>Cyperus esculentus</i>

COMMON NAME	SCIENTIFIC NAME
Sedge, cylindrical	<i>Cyperus retrorsus</i>
Sedge, globe	<i>Cyperus globulosus</i>
Sedge, Surinam	<i>Cyperus surinamensis</i>
Sedge, Texas	<i>Cyperus polystachyos</i>

Optimum control of purple nutsedge may be obtained using split applications of **VANDAL 4SC**. Apply 4-6 fluid ounces per acre followed by a second application to actively growing purple nutsedge. Do not exceed the maximum rate of 12 fluid ounces (0.375 lb ai/A) per season. **VANDAL 4SC** symptoms on purple nutsedge will be observed as reduced nutsedge stands necrosis, chlorosis, and/or stunting. Optimum control may not be observed until the second year after the original treatment.

REPLANTING IN NEW OR ESTABLISHED ORCHARDS AND VINEYARDS

Delay replanting at least 30 days after **VANDAL 4SC** applications when replacing trees and vines in newly planted and established orchards and vineyards. Use untreated soil when replanting trees and vines.

Precautions

These Crop Specific Use directions are based upon the interactive effects of **VANDAL 4SC** (Sulfentrazone) and the primary soil and environmental factors which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance previously presented under Product Application Instructions. General **VANDAL 4SC** Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weed Control, and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with **VANDAL 4SC**. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on **VANDAL 4SC** under specific local conditions. Invictis Crop Care, LLC does not recommend tank mixing this product with other products containing Sulfentrazone or other group 14 herbicides, as crop injury may occur.

Restrictions

- Do not apply **VANDAL 4SC** using airblast sprayers or by air. Use ground equipment only.
- Do not apply more than 12 fluid oz. product per acre (0.375 lb ai/A) per season.
- Apply to crops that have been growing for at least one full year and are in good condition.
- Avoid direct or indirect spray contact to foliage and green bark (wrap trunk with non porous wrap, grow tubes, or wax containers to keep spray solution off of green tissue).
- Do not apply to powdery soils or soils where wind may displace the soil unless irrigation can be applied immediately after application.
- Follow the most restrictive label of tank mix partners including all references to potential carryover and crop injury, warnings, and restrictions.
- Pre harvest Interval (PHI) 3 days.
- If two banded treatments are made in a growing season, allow a minimum of 60 days between applications however, do not exceed the seasonal maximum use rate.

TURNIPS

Apply 0.25 lbs. active ingredient (8 fluid ounces) per acre of Sulfentrazone. Make one post emergent application at 46-60 days before harvest. Apply in 10-40 gallons of water per acre.

Weeds Controlled

When applied according to directions, **VANDAL 4SC** will provide control of

Galinsoga, hairy	Waterhemp, common
Lambsquarters, common	Waterhemp, tall
Pigweed, redroot	

For information on other weeds not listed above refer to Weed Controlled section (Table 5) in this label.

Restrictions

- Do not apply more than 8.0 fluid ounces (0.25 pound active) per acre per 12 month period.
- Do not make more than one **VANDAL 4SC** application per acre per 12 month period. The twelve month period is considered to begin upon the initial **VANDAL 4SC** application.
- Do not use on soils classified as sand which have less than 1% organic matter.

RHUBARB

Apply 0.25 lbs. active ingredient (8 fluid ounces) per acre of Sulfentrazone. Make one post emergent broadcast application (just prior to rhubarb plants breaking dormancy) at 80 (+/- 5) days before harvest. Use a minimum of 10 gallons of water per acre.

Weeds Controlled

When applied according to directions, **VANDAL 4SC** will provide control of

Galinsoga, hairy	Waterhemp, common
Lambsquarters, common	Waterhemp, tall
Pigweed, redroot	

For information on other weeds not listed above refer to Weed Controlled section (Table 5) in this label

Restrictions

- Do not apply more than 8.0 fluid ounces (0.25 pound active) per acre per 12 month period.
- Do not make more than one **VANDAL 4SC** application per acre per 12 month period. The twelve month period is considered to begin upon the initial **VANDAL 4SC** application.
- Do not use on soils classified as sand which have less than 1% organic matter.

WHEAT (SPRING), (Pacific Northwest States- ID, OR, WA only)

Apply 0.188 lbs. active ingredient (6.0 fluid ounces) per acre of **VANDAL 4SC**. Make one pre plant or pre emergence application at 40-60 days before forage cutting and 120 days before grain harvest. Apply in 10-40 gallons of water per acre. (This use is limited for areas in the Pacific Northwest only).

Weeds Controlled

When applied according to directions, **VANDAL 45C** will provide control of:

Kochia (ALS and Triazine Resistant)	<i>Kochia scoparia</i>
Thistle, Russian	<i>Salsola kali</i>

For information on other weeds not listed above refer to Weed Controlled section (Table 5) in this label

Restrictions

Do not apply more than 6.0 fluid ounces (0.188 pound active) per acre per season.

Do not make more than one **VANDAL 45C** application per acre per 12 month period. The twelve month period is considered to begin upon the initial **VANDAL 45C** application.

Do not use on soils classified as sand which have less than 1% organic matter.

TURF GRASSES

(INCLUDING RESIDENTIAL AND INSTITUTIONAL LAWNS, ATHLETIC FIELDS, GOLF COURSE FAIRWAYS AND ROUGHS, AND COMMERCIAL SOD FARMS)

VANDAL 45C is a selective soil applied herbicide for the control of certain broadleaf weeds, grasses, and sedges. When applied according to directions it will provide control of susceptible species. **VANDAL 45C** is formulated as flowable (suspension concentrate) containing four pounds of the active ingredient Sulfentrazone per gallon.

The mode of action of **VANDAL 45C** involves uptake by weed roots and shoots. Observe all instructions, mixing directions, application precautions, and other label information of each product when tank mixing with **VANDAL 45C**.

VANDAL 45C may be applied to established seeded, sodded, or sprigged turfgrasses following the second mowing for the control of key grass sedge and broadleaf weeds. Turf grasses should have developed a good root system, a uniform stand with healthy root systems to fill in the exposed edges prior to application. Turf injury could result from application of this product on Turf that is not well established or has been weakened by stresses such as unfavorable weather conditions, diseases, chemical, recent harvesting, or mechanical influences

Turf Grass Tolerance

When applied as directed the following established Turf grasses are tolerant to **VANDAL 45C** at the listed use rates

Table 25 Tolerant grasses

Grass Type	Maximum Use Rate For Single Application	
	Fluid ounces VANDAL 45C Per Acre	Pound Active Ingredient Per Acre
Cool Season Grasses		
Bentgrass, creeping	4	0.125
Fescue, fine (<i>Festuca rubra</i>)	4-8	0.125 - 0.25
Fescue, tall (<i>Festuca arundinacea</i>)		
Ryegrass, perennial (<i>Lolium perenne</i>)		
Bluegrass, Kentucky (<i>Poa pratensis</i>)		
Bluegrass, Rough (<i>Poa trivialis</i>)		
Warm Season Grasses		
Bahiagrass (<i>Paspalum notatum</i>)	8 - 12	0.25 - 0.375
Buffalograss (<i>Buchloe dactyloides</i>)		
Carpetgrass (<i>Axonopus affinis</i>)		
Centipedegrass (<i>Eremochloa ophioides</i>)		
Kikuyugrass (<i>Pennisetum clandestinum</i>)		
Seashore Paspalum (<i>Paspalum vaginatum</i>)		
Zoysiagrass (<i>Zoysia japonica</i>)		
Bermudagrass (<i>Cynodon dactylon</i>)		
Bermudagrass Hybrids (<i>Cyn Bluegrass</i>)		
St Augustinegrass (<i>Stenotaphrum secundatum</i>)		

Applications of **VANDAL 45C** to certain varieties of Chewings, Fine, Fescue, or Tall Fescue may result in undesirable plant response.

* It is important to note that not all varieties of cultivars have been evaluated under treatment with **VANDAL 45C**. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on **VANDAL 45C** under specific local conditions.

Do not apply more than 12 fluid ounces (0.375 pound active) per acre of **VANDAL 45C per twelve month period. The twelve month period is considered to begin upon the initial **VANDAL 45C** herbicide application.

Applications to Reseeded, Overseeded, or Sprigged Areas

Reseeding, overseeding, or sprigging may be done following **VANDAL 45C** applications to turfgrasses. If reseeding, overseeding, or sprigging is done within 1 month following a **VANDAL 45C** application, the establishment of desirable grasses may be inhibited. Overseeding of bermudagrass with perennial ryegrass may be done two (2) to four (4) weeks following a **VANDAL 45C** application, provided slight grass plant response can be tolerated.

Optimum reseeding and overseeding results may be obtained with the use of mechanical or power seeding equipment and where proper soil cultivation, irrigation, and fertilization practices are followed.

Adjuvant use

Good spray coverage is required for optimum control of weeds. Temporary discoloration of some sod species may result from use of surfactant. Use of surfactants is not recommended.

Postemergence Control of Sedges

VANDAL 45C may be applied at the rate of four (4) to twelve (12) fluid ounces per acre to established turf grasses for the control or suppression of sedges. Select the correct **VANDAL 45C** use rate from Table 25.

When applied as directed VANDAL 45C will provide control or suppression of the following sedges

COMMON NAME	SCIENTIFIC NAME
Kyllinga, green	<i>Kyllinga brevifolia</i>
Kullinga, false green	<i>Kyllinga gracillima</i>
Nutsedge, purple	<i>Cyperus rotundus</i>
Nutsedge, yellow	<i>Cyperus esculentus</i>
Sedge, cylindrical	<i>Cyperus retrorsus</i>
Sedge, globe	<i>Cyperus globulosus</i>
Sedge, Surinam	<i>Cyperus surinamensis</i>
Sedge, Texas	<i>Cyperus polystachyos</i>

Purple nutsedge: For optimum control of purple nutsedge, split applications are listed below. Apply 4.8 Ounces per acre as an initial application followed by a second application when evidence of actively growing purple nutsedge is visible. Do not exceed the maximum rate per acre based on the turf variety as listed in Table 25 tolerant grasses.

Split Application Rates for Optimum Purple Nutsedge Control

Grass Type	First Application (fl. Ozs. Per Acre)	Second Application (fl. Ozs. Per Acre)
Cool Season Grasses	2 – 4 fl. Ounces	2 – 6 fl. Ounces
Warm Season Grasses	4 – 6 fl. Ounces	4 – 6 fl. Ounces

Allow 35 days after first application for second application

Postemergence Control of Grassy Weeds

VANDAL 45C will control or suppress specific annual grasses when applied at a rate of 4 to 12 fl oz/acre. Apply the highest rate consistent with the rate needed for turfgrass tolerance in Table 25. Rates lower than 12 fl oz/acre will generally control grasses for at least 60 days. VANDAL 45C works best if applied when the annual grasses are small (pre-tiller stage) and actively growing.

COMMON NAME	SCIENTIFIC NAME
Goosegrass	<i>Eleusine indica</i>

Postemergence Control of Broad leaf Weeds

VANDAL 45C herbicide will control or suppress the weeds listed in the broadleaf chart below when applied alone shortly after weeds have emerged. VANDAL 45C may be applied at the rate of four (4) to twelve (12) fluid ounces per acre to established turf grasses for the control or suppression of broadleaf weeds. Select the correct VANDAL 45C use rate from Table 25. For optimum results, VANDAL 45C applications should be made shortly after weeds have emerged.

VANDAL 45C may be tank mixed with other herbicides, insecticides, and fungicides registered for use on turfgrasses. Read and follow the label recommendations of the tank mix partner to determine turfgrass species, tolerance use rates, and application requirements. Follow all label restrictions, use directions, and precautionary statements before use.

When applied as directed, VANDAL 45C will provide control or suppression of the following broadleaf weeds

BROADLEAVES	SCIENTIFIC NAMES
Bittercress	<i>Cardamine</i> spp.
Black Medic	<i>Medicago lupulina</i>
Buttercup	<i>Ranunculus</i> spp.
Carolina geranium	<i>Geranium carolinianum</i>
Carpetweed	<i>Mollugo verticillata</i>
Chickweed, common	<i>Stellaria media</i>
Chickweed, mouseear	<i>Cerastium vulgatum</i>
Cinquefoil	<i>Potentilla</i> spp.
Clover	<i>Trifolium</i> spp.
Cudweed	<i>Gnaphalium</i> spp.
Dandelion	<i>Taraxacum officinale</i>
Dock, curly	<i>Rumex crispus</i>
Evening primrose	<i>Oenothera biennis</i>
Fiddleneck	<i>Amsinckia</i> spp.
Filaree	<i>Erodium</i> spp.
Garlic, wild	<i>Allium vineale</i>
Goldenrod	<i>Solidago</i> spp.
Ground ivy	<i>Glechoma hederacea</i>
Henbit	<i>Lamium amplexicaule</i>
Knotweed, prostrate	<i>Polygonum aviculare</i>

(continued)

BROADLEAVES	SCIENTIFIC NAMES
Kochia	<i>Kochia scoparia</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lawn burweed	<i>Sollva pterosperma</i>
Lespedeza, common	<i>Lespedeza striata</i>
Mallow, common	<i>Malva neglecta</i>
Onion, wild	<i>Allium canadense</i>
Parsley piert	<i>Alchemilla arvensis</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, tumble	<i>Amaranthus albus</i>
Pineapple weed	<i>Matricaria matricariodes</i>
Plantain, buckhorn	<i>Plantago lanceolata</i>
Puncture weed	<i>Tribulus terrestris</i>
Purslane, common	<i>Portulaca oleracea</i>
Pusley, Florida	<i>Richardia scabra</i>
Redweed	<i>Melochia corchorifolia</i>
Rocket, London	<i>Sysymbrium ino</i>
Smartweed, PA	<i>Polygonum pensylvanicum</i>
Sorrel, red	<i>Rumex acetosella</i>
Speedwell	<i>Veronica</i> spp.
Spurge, annual	<i>Euphorbia</i> spp.
Spurge, prostrate	<i>Euphorbia humifusa</i>
Spurge, spotted	<i>Euphorbia maculata</i>
Star of Bethlehem	<i>Omithogalon umbellatum</i>
Velvetleaf	<i>Abutilon theophrasti</i>
Violet, wild	<i>Viola pratensis</i>
Woodsorrel, creeping	<i>Oxalis corniculata</i>
Woodsorrel, yellow	<i>Oxalis stricta</i>

Restrictions

Do not apply more than 12.0 fluid ounces (0.375 pound active) per acre of **VANDAL 4SC** per twelve month period. The twelve month period is considered to begin upon the initial **VANDAL 4SC** application.

Sod production areas must be established three (3) months prior to the initial treatment of **VANDAL 4SC**.

Do not apply **VANDAL 4SC** to turf grasses not listed on this label.

Do not apply with surfactants.

Do not graze or feed forage harvested from **VANDAL 4SC** treated areas.

Do not apply to landscape, ornamental plants, or ornamental beds.

Do not harvest sod within three (3) months of **VANDAL 4SC** application.

Do not apply to golf course putting greens or tees.

Non-CROP USES

For Use in Railroad, Highway, Roadside, Pipeline and Utility Rights-of-Way, Industrial Areas, Fence Rows, and Other listed Non-crop Sites

APPLICATION INSTRUCTIONS

Utilize a boomless application system or a boom and nozzle sprayer equipped with the appropriate nozzles, spray tips, and screens and adjusted to provide optimum spray distribution and coverage at the appropriate operating pressures. Utilize nozzles and boomless sprayer configurations which produce minimal amounts of fine spray droplets. Do not exceed 25 psi spray pressure unless otherwise required by the manufacturer or drift reducing nozzles or boomless application systems. Apply a minimum of 10 gallons of finished spray per acre.

Water must be used as the carrier for this product when applied alone or when tank mixed with other herbicides.

Railroad Rights-of-Way

VANDAL 4SC can be used to control many weeds and maintain bare ground on railroad rights-of-way, including railroad yards, railroad crossings, and railroad bridge abutments.

Highway, Roadside, Pipeline and Utility Rights-of-Way

VANDAL 4SC can be used to control many weeds and maintain bare ground in highway, roadside, pipeline, and utility rights-of-way. Such areas would include, but are not limited to, guard rails, road shoulders, electric utility substations, pipeline pumping stations, around electric transmission towers, around distribution line poles, and in other areas where complete vegetation control is desired.

Industrial Areas, Fence Rows and Other Non-crop Sites

VANDAL 4SC controls weeds and maintains bare ground in industrial areas including production facilities, tank farms, storage areas, parking areas, lumber yards, airports, military installations, along fence rows, and in similar non-crop sites where complete vegetation control is needed.

Method and Rate of Application

For residual control of germinating weeds in non-crop land, apply this product as a broadcast treatment at 8 to 12 fluid ounces (0.25 to 0.375 pounds active ingredient) per acre by ground in a minimum of 10 gallons of spray solution per acre. Applications may be made by helicopter on railroad rights-of-way only.

DO NOT apply VANDAL 45C Herbicide to soils classified as sand with less than 1% Organic Matter.

Use labeled rates of burndown herbicides such as glyphosate, trimesium, diquat, 2,4-D, dicamba, etc. as tank mixtures with VANDAL 45C. Use recommended adjuvants for the herbicide tank mix partner. For all products used in tank mixes, refer to the specific product labels for all restrictions on tank mixing and observe all label precautions, instructions, and rotational cropping restrictions.

Timing

For best results apply VANDAL 45C alone or in combination with other herbicides for residual control of weeds in late summer, fall, or early spring to insure adequate moisture for soil activation.

Weeds Controlled

This product when applied at 8 to 12 fluid ounces per acre will control the following weeds in non-cropland areas. Use the higher labeled rates to extend length of control. Use the higher rates on sites with fine soil textures and on sites with more than 2% organic matter.

WEEDS CONTROLLED	
COMMON NAME	SCIENTIFIC NAME
Beggarweed, Florida	<i>Desmodium tortuosum</i>
Carpetweed	<i>Mollugo verticillata</i>
Chickweed, common	<i>Stellaria media</i>
Copperleaf, hophornbeam	<i>Acalypha ostryifolia</i>
Crabgrass species	<i>Digitaria</i> spp.
Croton, tropic	<i>Croton glandulosus</i>
Daisy, American	<i>Coreopsis grandiflora</i>
Dayflower, common	<i>Commelina communis</i>
Dayflower, Virginia	<i>Commelina virginica</i>
Dock, curly	<i>Rumex crispus</i>
Fixweed	<i>Descurainia Sophia</i>
Galinsoga, hairy	<i>Galinsoga ciliata</i>
Groundcherry, clammy (seedling)	<i>Physalis heterophylla</i>
Groundcherry, cutleaf	<i>Physalis angulata</i>
Jimsonweed	<i>Datura stramonium</i>
Kochia (ALS and Triazine Resistant Kochia)	<i>Kochia scoparia</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lettuce, wild	<i>Lactuca virosa</i>
Mallow, common	<i>Malva neglecta</i>
Milkweed, honeyvine	<i>Ampelamus albidus</i>
Mexicanweed	<i>Caperonia castanifolia</i>
Morningglory species	<i>Ipomoea</i> spp.
Mustard species	<i>Brassica</i> spp.
Nightshade species	<i>Solanum</i> spp.
Nutsedge species	<i>Cyperus</i> spp.
Palmer amaranth	<i>Amaranthus palmeri</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Texasweed	<i>Caperonia palustris</i>
Thistle, Russian	<i>Salsola iberica</i>
Waterhemp, tall	<i>Amaranthus tuberculatus</i>
Waterhemp, common	<i>Amaranthus rudis</i>

Do not apply more than 12 fluid ounces (0.375 pound active) per acre of VANDAL 45C per twelve month period. The twelve month period is considered to begin upon the initial VANDAL 45C application.

STORAGE AND DISPOSAL

Prohibitions

Do not contaminate water, food, or feed by storage and disposal. Do not use or store around the home.

Pesticide Storage - Store in original containers only. Keep container closed when not in use. Do not store near food or feed. In case of spill or leak on floor or paved surfaces, soak up with sand, earth, or synthetic absorbent. Remove to chemical waste area.

Pesticide Disposal - Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

Container Handling

NONREFILLABLE CONTAINER (EQUAL TO OR LESS THAN 5 GALLONS): Do not reuse or refill this container. 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 $\frac{1}{4}$ 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. Offer for recycling, if available or reconditioning if appropriate or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

NONREFILLABLE CONTAINER (GREATER THAN 5 GALLONS): Do not reuse or refill this container. Triple 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 $\frac{1}{4}$ 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. Offer for recycling, if available or reconditioning if appropriate or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

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 mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

REFILL ONLY WITH **VANDAL 45C**. The contents of RETURNABLE CONTAINERS cannot be completely removed by cleaning. Refilling with materials other than **VANDAL 45C** will result in contamination and may weaken container.

After filling and before transporting, check for leaks. Do not refill or transport damaged or leaking container.

CONDITION OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather, presence of other materials or other influencing factors in the use of the product, which are beyond the control of INNVICTIS CROP CARE, LLC or Seller. To the extent consistent with applicable law, all such risks shall be assumed by Buyer and User, and Buyer and User agree to hold INNVICTIS CROP CARE, LLC and Seller harmless for any claims relating to such factors.

INNVICTIS CROP CARE, LLC warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. This warranty does not extend to the use of this product contrary to label instructions or under conditions not reasonably foreseeable to or beyond the control of Seller or INNVICTIS CROP CARE, LLC, and Buyer and User assume the risk of any such use. **TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, INNVICTIS CROP CARE, LLC MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.**

To the extent consistent with applicable law, neither INNVICTIS CROP CARE LLC nor Seller shall be liable for any incidental, consequential or special damages resulting from the use or handling of this product. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF INNVICTIS CROP CARE, LLC AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF INNVICTIS CROP CARE, LLC OR SELLER, THE REPLACEMENT OF THE PRODUCT.

INNVICTIS CROP CARE, LLC and Seller offer this product, and Buyer and User accept it, subject to the foregoing Conditions of Sale and Limitation of Warranty and Liability, which may not be modified except by written agreement signed by a duly authorized representative of INNVICTIS CROP CARE, LLC.

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