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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D C 20460

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

Ms Shannon Yanocha
FMC Corporation
1735 Market Street
Philadelphia, PA 19103

SEP 28 2012

Subject Label Amendment to add new uses of Petition No 1F7838 (citrus fruit crop group, low growing berry crop group, tree nut crop group including pistachio), IR-4 Petition No 1E7890 (rhubarb, turnip, sunflower crop subgroup B, spring wheat, succulent cowpea, lima bean), and IR-4 Petition No 2E8020 (edamame) to the herbicide product labels listed below containing the active ingredient, Sulfentrazone
EPA Reg Nos 279-3189, 279-3149, 279-3220, and 279-3370
Decision Numbers 445542, 445543, 445544, 445548, 450876, 450882, 450885, 450886, 464038, 464040, 464041, 464042

Dear Ms Yanocha

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, is acceptable provided the following label revisions are made

- 1 For all new uses being added to the dry flowable formulation (279-3189), add the following chemigation prohibition to the restriction section "Do not apply through irrigation equipment "
- 2 For all of the IR-4 minor uses being added to the dry flowable formulation (279-3189), add the following aerial prohibition to the restriction section "Do not apply by air "
- 3 For all new uses being added to the liquid formulations (279-3370 and 279-3220), add the following prohibition to the restriction section "Do not apply using a mechanically pressurized handgun "

The Agency notes that FMC agrees to conduct a 28-day inhalation study in rats to establish a NOAEL for occupational inhalation exposure and risk assessment, within 18 months of the date of this letter. A study protocol will be submitted to EPA for review before conducting this study. Depending on the results of this inhalation study, the label mitigation for occupational uses may be revisited. Until this study provides the Agency with a NOAEL for occupational inhalation exposure, the label revisions listed above must be incorporated in the final printed labels for these products.

Continued on page 2

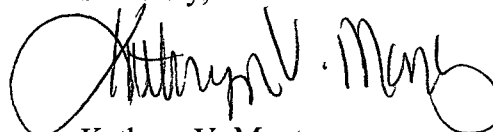
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Subject Label Amendment to add new uses of Petition No 1F7838 (citrus fruit crop group low growing berry crop group tree nut crop group including pistachio) IR 4 Petition No 1E7890 (rhubarb turnip sunflower crop subgroup B spring wheat succulent cowpea lima bean) and IR 4 Petition No 2E8020 (edamame) to the herbicide product labels listed below containing the active ingredient Sulfentrazone
EPA Reg Nos 279 3189 279 3149 279 3220 and 279 3370
Decision Numbers 445542 445543 445544 445548 450876 450882 450885 450886 464038 464040 464041 464042

One copy of labeling for these products, stamped "Accepted with Comments," is enclosed for your records Products released for shipment after 18 months from the date on this notice or the next printing of the label, whichever occurs first, must bear the new revised label Amended labeling will supersede all previously accepted ones

Per 40 CFR 156 10(6), submit one copy of your final printed labeling before you release the product for shipment If you have questions or concerns regarding this letter, please contact Beth Benbow at (703) 347-8072 or email at benbow.bethany@epa.gov

Sincerely,



Kathryn V Montague
Product Manager 23
Herbicide Branch
Registration Division (7505P)

3/56

SPARTAN 4F Herbicide

Group **14** Herbicide

EPA Reg No 279 3220

EPA Est 279

Active Ingredient
Sulfentrazone
Other Ingredients

By Wt
39.6%
60.4%
100.0%

Contains 4 pounds of active ingredient per gallon

ACCEPTED
with COMMENTS
In EPA Letter Dated
SEP 28 2012
Under the Federal Insecticide
Fungicide and Rodenticide Act
as amended for the pesticide
registered under EPA Reg. No

279-3220

KEEP OUT OF REACH OF CHILDREN CAUTION

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

FIRST AID

If Inhaled

Move person to fresh air. If person is not breathing call 911 or an ambulance then give artificial respiration preferably by mouth to mouth if possible. Call a poison control center or doctor for further treatment advice.

If on Skin or Clothing

Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

If in Eyes

Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses if present after the first 5 minutes. Then continue rinsing eye. Call a poison control 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 also contact 1-800-331-3148 for emergency medical treatment information.

From **FMC**
FMC Corporation
1735 Market Street
Philadelphia PA 19103

ATTENTION

Although this label may appear similar to the label on a product you may have used, there may be important label differences. Users must read, understand and strictly follow all label directions, precautions and restrictions. It is the user's responsibility to be sure the product is approved for sale or use on the intended crop and for use in the specific geographic area. It is the user's responsibility to be aware of and to follow all State or local precautions or restrictions not appearing on this product label. Prior to purchase or use of this product, read the Terms of Sale or Use and Limitation of Warranty and Liability on page 2 of this label. If the terms and conditions are unacceptable, return the product immediately in the original and unopened container.

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PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

Caution

Causes moderate eye irritation Harmful if inhaled swallowed or absorbed through skin Avoid breathing vapor or spray mist Avoid contact with skin eyes or clothing

Personal Protective Equipment (PPE)

Applicators and other handlers must wear long sleeved shirt and long pants chemical resistant gloves made of any waterproof material such as polyethylene or polyvinyl chloride and shoes plus socks

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 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 use or store near heat or open flame

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 SPARTAN 4F per acre per twelve month period as stated in Table 4 The twelve month period is considered to begin upon the initial SPARTAN 4F 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.

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

STORAGE AND DISPOSAL

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

Pesticide Storage

Store product in original container only, away from other pesticides, fertilizer, food, or feed. Store in a cool, dry place and avoid excess heat.

In Case of Spill

In case of spill, avoid contact, isolate area, and keep out animals and unprotected persons. Confine spills. Call CHEMTREC (Transportation and spills) (800) 424-9300.

To Confine Spill

To confine spill: If liquid, dike surrounding area or absorb with sand, cat litter, or commercial clay. If dry material, cover to prevent dispersal. Place damaged package in a holding container. Identify contents.

Pesticide Disposal

Waste resulting from the use of this product may be disposed of at an approved waste disposal facility.

Container Disposal

Nonrefillable container: Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: (For containers greater than 5 gallons) Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. (For containers 5 gallons or less) Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Triple rinse (or equivalent). Then offer for recycling, if available, or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Returnable/Refillable Containers: 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 into application equipment or mix tank. Fill the container about 10% 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.

CONDITIONS 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. Crop injury, ineffectiveness, or other unintended consequences may result because of such factors as manner of use or application, weather, or crop conditions beyond the control of FMC or Seller. All such risks shall be assumed by Buyer and User, and to the extent consistent with applicable law, Buyer and User agree to hold FMC and Seller harmless for any claims relating to such factors.

Seller warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the Directions for Use when used in accordance with the directions under normal conditions of use. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, FMC MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, NOR ANY OTHER EXPRESS OR IMPLIED WARRANTIES WITH RESPECT TO THE SELECTION, PURCHASE, OR USE OF THIS PRODUCT. Any warranties, express or implied, having been made are inapplicable if this product has been used contrary to label instructions, or under abnormal conditions, or under conditions not reasonably foreseeable to (or beyond the control of) seller or FMC, and to the extent consistent with applicable law, buyer assumes the risk of any such use.

To the extent consistent with applicable law, FMC or seller shall not 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 FMC 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 FMC OR SELLER, THE REPLACEMENT OF THE PRODUCT.

This Conditions of Sale and Limitation of Warranty and Liability may not be amended by any oral or written agreement.

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 can not 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

SPARTAN 4F is a selective soil applied herbicide for the control of susceptible broadleaf grass and sedge weeds. SPARTAN 4F is formulated as a 4 pounds per gallon flowable containing 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 SPARTAN 4F treatment a shallow incorporation may be needed to obtain desired weed control.** When activating moisture is received after dry conditions SPARTAN 4F will provide a reduced level of control of susceptible germinating weeds. Soil applications of SPARTAN 4F 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.

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 SPARTAN 4F.

Proper handling instructions SPARTAN 4F 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

SPARTAN 4F 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 layby 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 SPARTAN 4F rates that could result in adverse crop response.

All soil applications and the residual activity of post plant applications of SPARTAN 4F 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 SPARTAN 4F can await activating moisture for extended periods (10 to 14 days or longer) depending on the soil parameters described above. Once activated SPARTAN 4F 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 SPARTAN 4F a shallow incorporation is recommended for destruction of any germinating weeds and to incorporate SPARTAN 4F. 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 SPARTAN 4F. 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.

SPARTAN 4F HERBICIDE PRODUCT USE RATES

The following directions for the selection of SPARTAN 4F application rates are critical to achieve maximum performance and to insure maximum crop safety. The user is required to read and follow the specific SPARTAN 4F 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 SPARTAN 4F. This response is governed by the SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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

<u>COARSE</u>	<u>MEDIUM</u>	<u>FINE</u>
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 SPARTAN 4F 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 effect 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 in any 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 SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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 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.

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

SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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.

SPARTAN 4F should be metered into the irrigation system continuously for the duration of the water application. SPARTAN 4F 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 SPARTAN 4F 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. SPARTAN 4F 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 or 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

SPARTAN 4F may be applied impregnated on dry fertilizers. When applied as directed with adequate soil coverage, SPARTAN 4F dry bulk fertilizer mixtures will provide satisfactory weed control.

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

Apply SPARTAN 4F /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 SPARTAN 4F/dry fertilizer mixture.

Impregnation Directions

To impregnate SPARTAN 4F 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 SPARTAN 4F in a clean container using clear water. Slowly add the SPARTAN 4F/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 SPARTAN 4F 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 SPARTAN 4F dry bulk fertilizer with an accurately calibrated dry fertilizer spreader. The SPARTAN 4F 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 SPARTAN 4F use rates could result in possible crop response.

A minimum of 200 pounds of dry bulk fertilizer impregnated with the listed amount of SPARTAN 4F must be applied per acre to achieve adequate soil coverage for satisfactory weed control.

DO NOT impregnate SPARTAN 4F onto coated ammonium nitrate or limestone because these materials will not absorb the herbicide.

Refer to the appropriate crop section of the SPARTAN 4F label to determine the rate of SPARTAN 4F to be applied per acre. Use the following table to determine the amount of SPARTAN 4F 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 SPARTAN 4F to be impregnated on a ton of dry bulk fertilizer using the following formula:

$$\begin{array}{rcl}
 2000 & \text{SPARTAN 4F use rate} & \text{ounces of SPARTAN 4F} \\
 \text{Pounds dry fertilizer} & \times \text{ in fluid ounces} & = \text{ to be applied per} \\
 \text{per acre} & \text{per acre} & \text{ton of fertilizer}
 \end{array}$$

RATE CHART FOR IMPREGNATION OF DRY BULK FERTILIZERS WITH SPARTAN 4F

Table 2

Dry Fertilizer Rate (lb/acre)	Ounces SPARTAN 4F per ton of fertilizer		
	SPARTAN 4F Use Rate Per Acre		
	8 0 Fluid Ounces per Acre	10 1 Fluid Ounces per Acre	12 0 Fluid Ounces 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

SPARTAN 4F 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, SPARTAN 4F 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 SPARTAN 4F in a clean container with clean water using equal volumes of SPARTAN 4F and clean water. Slowly add the SPARTAN 4F/water slurry to the spray tank. Carefully rinse the slurry container, adding the rinse to the spray tank. Better mixing of the SPARTAN 4F/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 SPARTAN 4F slurry is thoroughly mixed before application.

For tank mixtures with other herbicide(s), 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 SPARTAN 4F spray mixture immediately after mixing. Do not store the sprayer overnight or for any extended period of time with the SPARTAN 4F spray mixture remaining in the tank.

Do not premix SPARTAN 4F spray solutions in nurse tanks.

Follow all SPARTAN 4F 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 SPARTAN 4F 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 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 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 Applicators 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 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 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 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 habitat for threatened or endangered species non target crops)

Off Target Movement of SPARTAN 4F

Drift of dilute spray mixtures containing SPARTAN 4F 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 SPARTAN 4F can cause significant symptomology by drift on to sensitive crops and other plants This symptomology may manifest initially as discreet localized spots where contacted by SPARTAN 4F 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 SPARTAN 4F on to unintended crops or plants irrespective of severity constitutes misapplication of this product FMC accepts no responsibility or liability for potential crop effects that may result from such misapplication of SPARTAN 4F

MAXIMUM ALLOWABLE SPARTAN 4F USE PER ACRE PER 12 MONTH PERIOD*

Refer to the crop section of this label for specific product use directions
Table 3

Crop	Ounces SPARTAN 4F Per Acre	Pound 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 SPARTAN 4F application.

CROP ROTATIONAL RESTRICTIONS (14 0)

The following Table 4 shows the minimum interval in months from the time of the last Spartan 4F application until Spartan 4F treated soil can be replanted to the crops listed. When Spartan 4F 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 Spartan 4F 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

Brassica leafy greens	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 Shell Peas and Beans	Anytime
Flax	Anytime
Fruting 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 80 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

Band Width Inches	X	Broadcast Rate Per Acre	=	Band Rate
Row Width Inches				
Band Width Inches	X	Broadcast Volume Per Acre	=	Band Volume
Row Width Inches				

MIXING AND LOADING INSTRUCTIONS

SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F in a clean container using clean water Slowly add the SPARTAN 4F/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 SPARTAN 4F is thoroughly mixed before application or before adding another product to the spray tank.

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

Do not pre-mix SPARTAN 4F spray solutions in nurse tanks.

If SPARTAN 4F 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 SPARTAN 4F 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 appropriate steps to ensure proper equipment clean-out for any other products mixed with SPARTAN 4F 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 rinse water 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 SPARTAN 4F 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 SPARTAN 4F 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. FMC accepts no liability for any effects due to inadequately cleaned equipment.

Do not drain or 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 SPARTAN 4F is applied in accordance with the Application information and the specific crop use directions, SPARTAN 4F 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 ostryeafolia</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>Verbesina encelioides</i>
Cupgrass woolly	<i>Enchloa 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>
Flixweed	<i>Descurainia sophia</i>
Galinsoga hairy	<i>Galinsoga ciliata</i>
Goosegrass	<i>Eleusine 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 altissimum</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 rederule</i>
Poinsetta 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>
Sheperdspurse	<i>Capsella bursa pastonis</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 cilianensis</i>
Toadflax yellow	<i>Linana vulgans</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>
Witchgrass	<i>Panicum capillare</i>

REPLANTING INSTRUCTIONS

If initial planting of labeled crops fails to produce a stand only labeled crops for SPARTAN 4F or the tank mix partner whichever is most restrictive may be planted. Do not retreat field with SPARTAN 4F 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 Tolerant to PPO Herbicides)

Table 6

SPARTAN 4F Use Rate Table (Corn) Fall Spring Early Preplant Preemergence and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F per acre		
% Organic Matter	Soil Texture		
	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	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)

SPARTAN 4F may be applied in the fall as a preplant treatment prior to corn planting the following spring

SPARTAN 4F can be used alone or in a tank mixture with other herbicides to control susceptible broadleaves, sedges and grasses in corn. Apply SPARTAN 4F in conventional tillage or conservation tillage (reduced tillage or no tillage) cropping systems using rates listed in the Table 6. SPARTAN 4F 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 SPARTAN 4F runoff from rain or snowmelt that may occur following application. SPARTAN 4F may be tankmixed 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 SPARTAN 4F 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 SPARTAN 4F should be the mid to high rate within the rate range for the appropriate soil type and organic matter.

Early Preplant and Preemergence (Spring Applications)

SPARTAN 4F may be applied preplant on the soil surface in the spring to control weeds in conventional and conservation tillage systems. SPARTAN 4F 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 appropriate rate range for the soil and organic matter type listed in Table 6. SPARTAN 4F 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, SPARTAN 4F may be tankmixed with insecticides including Mustang Max or Capture 2EC. If dry conditions persist following preemergence application of SPARTAN 4F, a shallow incorporation may be needed to activate the herbicide. If weeds are emerged at the time of SPARTAN 4F application, use a burndown herbicide in conjunction with SPARTAN 4F as needed. When planting into soil treated preplant with SPARTAN 4F, minimize soil disturbance to maintain the herbicide barrier on the soil surface to achieve maximum weed control. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Preplant Incorporated

SPARTAN 4F may be applied as a Preplant Incorporated treatment in the spring prior to planting in reduced and conventional tillage corn. SPARTAN 4F 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 SPARTAN 4F deeper than 2 inches may result in inconsistent weed control. Use the appropriate rate from Table 6 for the soil texture, organic matter, and pH level of the soil. SPARTAN 4F can be tankmixed with other soil applied herbicides and insecticides labeled for preplant incorporation in corn. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

SPARTAN 4F 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 SPARTAN 4F (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, SPARTAN 4F 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 SPARTAN 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F runoff from rain or snowmelt that may occur following application.

FALLOW OR POST HARVEST BURNDOWN

SPARTAN 4F may be applied in the fall following crop harvest or in existing fallow fields of asparagus, cabbage, corn, dry shell peas and beans, horseradish, limas, mint, peanuts, potatoes, soybeans, sugarcane, sunflowers and tobacco.

Table 7

SPARTAN 4F Use Rate Table (Fallow or Post Harvest Burndown)			
Fall and Spring Fallow Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F 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	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)

SPARTAN 4F may be applied in the fall following crop harvest or in existing fallow fields to control or suppress weeds the following season. The SPARTAN 4F Rotational Crop Guidelines in Table 4 must be followed if crops are planted the next season. SPARTAN 4F 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 SPARTAN 4F runoff from rain or snow that may occur following application. SPARTAN 4F may be tankmixed with herbicides to control emerged weeds. Sequential applications may be needed depending on weed size. In situations where weed size may interfere with SPARTAN 4F reaching the soil surface, a separate burndown application prior to the application of SPARTAN 4F will be required. Use listed rates of burndown herbicides in combination with SPARTAN 4F or sequential applications as needed. Higher aerial spray volumes are required when there is a dense weed population or canopy.

SPARTAN 4F can be tankmixed with other herbicides. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Spring Preemergence Application

SPARTAN 4F 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 SPARTAN 4F. Follow the same use rate recommendations and application guidelines listed under the Fall Application section above.

Weeds Controlled

When applied according to directions, SPARTAN 4F 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 SPARTAN 4F (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, SPARTAN 4F 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 SPARTAN 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions.

Use 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 SPARTAN 4F 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 SPARTAN 4F runoff from rain or snowmelt that may occur following application

PEANUTS

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

Apply SPARTAN 4F 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 SPARTAN 4F is registered for use on peanuts only in the following states AL GA MS NC SC and VA

Application Instructions

SPARTAN 4F may be preplant incorporated (to a depth no greater than 2 inches) up to 14 days prior to planting Alternatively SPARTAN 4F may be applied to the soil surface at planting or within 12 hours after planting Incorporation of SPARTAN 4F deeper than 2 inches can result in adverse crop response and/or inconsistent weed control Do not use SPARTAN 4F 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 SPARTAN 4F plus a grass herbicide labeled for peanuts is recommended Under conditions of exceptionally high weed populations or when weeds not controlled by SPARTAN 4F are anticipated the use of suitable post emergent peanut herbicides is recommended Broadcast apply the correct SPARTAN 4F use rate from the tables below in a minimum of 10 gallons of water per acre of finished spray Banded SPARTAN 4F application rates must be adjusted in proportion to the broadcast rate

SPARTAN 4F Use Rates and Weeds Controlled in Coarse Soils¹

When applied as directed at 4 8 fluid ounces (0 15 pound active ingredient) per acre SPARTAN 4F 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 SPARTAN 4F will provide Control of the listed weeds

All the weeds controlled at 4 8 fl ozs 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 SPARTAN 4F will provide Control of the listed weeds

All the weeds controlled at 6 4 fl ozs plus	
Anoda spurred	Purslane common
Cocklebur common	Sida prickly
Nutsedge yellow	Starbur prickly
Nutsedge purple ³	

¹Use rates are SPARTAN 4F 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 ai) should not exceed 9 6 fluid ounces (0 3 lb ai) per acre

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

³ Purple nutsedge activity is based on preplant incorporated applications of SPARTAN 4F 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 SPARTAN 4F application rate Irrigation with alkaline (pH 8 to 9) water can result in adverse crop response The extent of crop response is dependent on SPARTAN 4F application rate soil type (including %OM and pH) timing (after SPARTAN 4F 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 SPARTAN 4F (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 SPARTAN 4F 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 SPARTAN 4F Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions

Restrictions

Do not apply more than 9.6 fluid ounces (0.3 lb ai) of SPARTAN 4F per acre per twelve month period The twelve month period is considered to begin upon the initial SPARTAN 4F 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

SPARTAN 4F Use Rate Table (Potatoes)			
Preemergence Application			
Broadcast Rate	Fluid Ounces SPARTAN 4F 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	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 SPARTAN 4F by aerial application as a preemergence treatment following planting and after dragoff but prior to potato emergence Optimum performance can be achieved if SPARTAN 4F 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 appropriate 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 SPARTAN 4F application an appropriate burndown herbicide and adjuvants labeled for potatoes may be tankmixed with SPARTAN 4F to control these weeds Do not apply SPARTAN 4F if the potatoes have emerged from the soil as undesirable crop response may occur SPARTAN 4F may be tankmixed with other soil applied herbicides labeled for use in potatoes to improve weed management and increase weed control spectrum

Apply SPARTAN 4F in a minimum of 10 gallons of spray by ground application and 5 gallons of spray by air

Chemigation Applications

SPARTAN 4F may be applied to potatoes through sprinkler irrigation systems including center pivot lateral move end tow solid set or hand move irrigation systems Apply SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F on an untested variety always determine the crop tolerance before planting Some potato varieties including Sangre Shepody and Snowden have shown sensitivity to SPARTAN 4F Caution should be used when planting these varieties on marginal coarse soils

These Crop Specific Use directions are based upon the interactive effects of SPARTAN 4F (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 SPARTAN 4F 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 SPARTAN 4F Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions

Restrictions

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

Do not apply SPARTAN 4F 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 SPARTAN 4F application

SOYBEANS

Table 9

SPARTAN 4F Use Rate Table (Soybeans)			
Fall Spring Early Preplant Preemergence and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F per acre		
	Soil Texture		
% Organic Matter	Coarse	Medium	Fine
<1.5	4.5 – 6.0	6.0 – 8.0	8.0
1.5 – 3	6.0 – 8.0	8.0 – 10.1	10.1
>3	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

Ground and Aerial Applications

Apply SPARTAN 4F in conventional tillage conservation tillage reduced tillage or no tillage cropping systems using rates listed in the SPARTAN 4F Use Rate Table 9 SPARTAN 4F 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

SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F applied near or after crop emergence may cause severe injury to the crop SPARTAN 4F can be applied alone or in combination with other labeled soybean herbicides SPARTAN 4F 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 SPARTAN 4F in no till or minimum till cropping systems tank mix with an appropriate burndown herbicide for improved control of existing weeds

Fall Applications

SPARTAN 4F 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 SPARTAN 4F must be made in weed control programs that include as needed spring applications of preplant preemergence or postemergence herbicides for the following crop season SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F with other registered herbicides refer to specific label information on precautions instructions limitations application methods and timings and weeds controlled

SPARTAN 4F 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 SPARTAN 4F (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, SPARTAN 4F 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 SPARTAN 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions.

Restrictions

Do not apply more than 12.0 fluid ounces (0.375 lbs active) per acre of SPARTAN 4F per twelve month period. The twelve month period is considered to begin upon the initial SPARTAN 4F 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 SPARTAN 4F runoff from rain or snowmelt that may occur following application.

Do not apply after crop seed germination.

SUGARCANE

Table 10

SPARTAN 4F Use Rate Table (Sugarcane)			
Planting Time and Lay by Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F per acre		
% Organic Matter	Soil Texture		
	Coarse	Medium	Fine
<1.5	4.5 – 6.0	6.0 – 8.0	8.0
1.5 – 3	6.0 – 8.3	8.0 – 10.1	10.1
>3	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 SPARTAN 4F as a broadcast or banded preemergence soil applied treatment for the control of broadleaf weeds, grasses, and sedges in sugarcane. Refer to the SPARTAN 4F Product Use Rate Section and Table 10 for specific use information.

Planting Time Applications

Apply SPARTAN 4F preemergence 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. SPARTAN 4F may be applied with other herbicides registered for use in sugarcane.

Aerial Applications

SPARTAN 4F may be applied by air in a minimum of 5 gallons of finished spray per acre. SPARTAN 4F may be applied with other herbicides or insecticides registered for aerial application in sugarcane.

Lay by Applications

Apply SPARTAN 4F 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. SPARTAN 4F may be applied with other herbicides registered for use in sugarcane.

Weeds Controlled

When applied according to directions, SPARTAN 4F 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 SPARTAN 4F (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, SPARTAN 4F 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 SPARTAN 4F.

4F Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F 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 SPARTAN 4F per acre per twelve month period. The twelve month period is considered to begin upon the initial SPARTAN 4F application.

SUNFLOWER SUBGROUP 20B

Calendula Castor oil plant Chinese tallowtree Euphorbia Evening primrose Jojoba Niger seed Rose hip Safflower Stokes aster Sunflower Tallowwood Tea oil plant Vernonia cultivars varieties and/or hybrids of these

Table 11

SPARTAN 4F Use Rate Table (Sunflower subgroup 20B)			
Fall Early Spring Preplant Preemergence and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F per acre		
% Organic Matter	Soil Texture		
	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	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)

SPARTAN 4F may be applied in the fall as a preplant treatment to control or suppress weeds prior to planting the following spring. SPARTAN 4F 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 SPARTAN 4F runoff from rain or snow melt that may occur following application. SPARTAN 4F 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 SPARTAN 4F application use a burndown herbicide such as glyphosate or paraquat at the full labeled rate in combination with SPARTAN 4F or split application as needed. Select the appropriate rate from Table 11 above within the correct soil type and organic matter range. When applying SPARTAN 4F 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)

SPARTAN 4F may be applied preplant on the soil surface in the spring to control weeds. SPARTAN 4F 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 SPARTAN 4F to coarse textured soils with less than 1.5% organic matter wait a minimum of 7 days after application before planting. SPARTAN 4F 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 SPARTAN 4F a shallow incorporation may be needed to incorporate and activate the herbicide. If weeds are emerged at the time of SPARTAN 4F application use a burndown herbicide at the full labeled rate in combination with SPARTAN 4F or split application as needed.

Preplant Incorporated (PPI)

SPARTAN 4F may be applied as a Preplant Incorporated treatment in the spring prior to planting in reduced and conventional tillage. SPARTAN 4F should be shallowly incorporated in the soil no deeper than 2 inches. Incorporating SPARTAN 4F deeper than 2 inches can result in inconsistent weed control. Use the appropriate rate from Table 11 above for the soil texture organic matter and pH level. SPARTAN 4F can be tankmixed with other soil applied herbicides labeled for preplant incorporation in sunflowers or other crops in subgroup 20B.

Weeds Controlled

When applied according to directions SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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. SPARTAN 4F 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 SPARTAN 4F (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, SPARTAN 4F 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 SPARTAN 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions.

Restrictions

Do not apply more than 8.0 fluid ounces (0.25 pound active) of SPARTAN 4F per twelve month period to sunflowers. The twelve month period is considered to begin upon the initial SPARTAN 4F application.

Do not apply to frozen soils or existing snow cover to prevent SPARTAN 4F 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

SPARTAN 4F Use Rate Table (Tobacco)			
Preemergence and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F per acre		
% Organic Matter	Soil Texture		
	Coarse	Medium	Fine
<1.5	4.5 - 6.0	6.0 - 8.0	8.0
1.5 - 3	6.0 - 8.0	8.0 - 10.1	10.1
>3	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.

SPARTAN 4F may be surface applied or preplant incorporated (to a depth no greater than 2 inches) from 14 days to 12 hours prior to transplanting tobacco. Incorporating SPARTAN 4F deeper than 2 inches can result in inconsistent weed control.

Broadcast apply the appropriate SPARTAN 4F 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 SPARTAN 4F. Once the field has been prepared for planting, SPARTAN 4F may be surface applied or lightly preplant incorporated from 14 days to 12 hours prior to transplanting.

If SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F application.

When incorporating prior to bedding, SPARTAN 4F must be thoroughly and uniformly incorporated to a depth no greater than 2 inches to avoid concentrating SPARTAN 4F 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 SPARTAN 4F 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, SPARTAN 4F 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 tall	

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 effect 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 SPARTAN 4F (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 SPARTAN 4F 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 SPARTAN 4F Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions

Restrictions

Do not use on Shade Grown Tobacco

Do not apply SPARTAN 4F to soils classified as sands containing less than 1% organic matter

Do not use SPARTAN 4F in tobacco seeding beds or greenhouses

Do not apply SPARTAN 4F post transplant as unacceptable injury may occur

Do not perform tillage practices that concentrate SPARTAN 4F into the bed or crop injury may occur

Do not apply more than 12.0 fluid ounces (0.375 lbs active) per acre of SPARTAN 4F per acre per twelve month period The twelve month period is considered to begin upon the initial SPARTAN 4F application

Do not incorporate greater than 2 inches deep

VEGETABLE CROPS

Before applying SPARTAN 4F 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 2 of this label

ASPARAGUS

Table 13

SPARTAN 4F Use Rate Table (Asparagus)			
Spring Preemergence Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F 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 use rate 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 SPARTAN 4F as a broadcast treatment to crowns established for one or more years

Apply in the spring before the crop and weeds emerge SPARTAN 4F 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 SPARTAN 4F may be applied with other pesticides registered for use with asparagus

Weeds Controlled

When Applied according to directions SPARTAN 4F 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 SPARTAN 4F (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, SPARTAN 4F 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 SPARTAN 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F 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 SPARTAN 4F application per acre per 12 month period. The twelve month period is considered to begin upon the initial SPARTAN 4F 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 broccoli, kohlrabi

Table 14

SPARTAN 4F Herbicide Use Rate Table (Head and Stem Brassica)			
Fall or Spring Early Preplant, Preemergence, and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F Herbicide 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)

SPARTAN 4F Herbicide may be applied in the fall or spring preceding the growing season up to 72 hours prior to transplanting head and stem brassica. SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide runoff from rain or snow that may occur following application. SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide or split applications as needed. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Preplant Incorporated (PPI)

SPARTAN 4F Herbicide 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. SPARTAN 4F Herbicide 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. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Weeds Controlled

When Applied according to directions, SPARTAN 4F Herbicide will provide control of

Galinsooga hairy	Waterhemp common
Lambsquarters common	Waterhemp tall
Pigweed redroot	

Precautions

These Crop Specific Use directions are based upon the interactive effects of SPARTAN 4F Herbicide (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, SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F Herbicide under specific local conditions

Restrictions

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

Table 15

SPARTAN 4F Herbicide Use Rate Table (Leafy Brassica)			
Fall or Spring Early Preplant Preemergence and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F Herbicide per acre		
% Organic Matter	Soil Texture		
	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)

SPARTAN 4F Herbicide may be applied in the fall or spring preceding the growing season up to 72 hours prior to planting leafy brassica SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide runoff from rain or snow that may occur following application SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide or split applications as needed Observe all precautions instructions and rotational cropping guidelines of each product s label when tank mixing including all references to potential carryover and crop injury warnings or restrictions

Preplant Incorporated (PPI)

SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide 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 Observe all precautions instructions and rotational cropping guidelines of each product s label when tank mixing including all references to potential carryover and crop injury warnings or restrictions

Weeds Controlled

When Applied according to directions SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide (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 SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F Herbicide under specific local conditions

Restrictions

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

SPARTAN 4F Use Rate Table (Cabbage)			
Fall or Spring Early Preplant, Preemergence, and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F per acre		
% Organic Matter	Soil Texture		
	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)

SPARTAN 4F 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. SPARTAN 4F may be applied in the spring from 60 days prior to planting up to planting time. SPARTAN 4F 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 SPARTAN 4F runoff from rain or snow that may occur following application. SPARTAN 4F may be tankmixed 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 SPARTAN 4F or split applications as needed. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Preplant Incorporated (PPI)

SPARTAN 4F 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. SPARTAN 4F can be tankmixed with other burndown or soil applied herbicides labeled for use in cabbage. Use the listed rates of burndown herbicides or split applications as needed. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Transplant Cabbage

SPARTAN 4F 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. SPARTAN 4F may be applied as a banded treatment into the row middles within 72 hours after transplanting.

Weeds Controlled

When Applied according to directions, SPARTAN 4F 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 SPARTAN 4F (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, SPARTAN 4F 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 SPARTAN 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions.

Restrictions

Do not apply more than 12 fluid ounces (0.375 pound active) per acre of SPARTAN 4F per application or per twelve month period. The twelve month period is considered to begin upon the initial SPARTAN 4F 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 SHELLED BEANS AND PEAS

Dried cultivars of bean (*Lupinus*) bean (*Phaseolus*) (includes field bean kidney bean lima bean (dry) navy bean pinto bean tepary bean) bean (*Vigna*) (includes adzuki bean blackeyed pea catjang cowpea crowder pea moth bean lentil mung bean rice bean southern pea urd bean) broad bean (dry) chickpea guar lab lab bean pea (*Pisum*) (includes field pea) and pigeon pea

Table 17

SPARTAN 4F Use Rate Table (Dry Shelled Beans Peas)			
Fall or Spring Early Preplant Preemergence and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F 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)

SPARTAN 4F may be applied in the fall as a preplant treatment to control or suppress weeds prior to planting the following spring. SPARTAN 4F 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 SPARTAN 4F runoff from rain or snow melt that may occur following application. SPARTAN 4F may be tank mixed with other residual soil herbicides that are labeled for fall use on dry bean and dry peas. If weeds are emerged at the time of SPARTAN 4F application use a burndown herbicide such as glyphosate or paraquat at the full labeled rate in combination with SPARTAN 4F or split application as needed. Select the appropriate rate from Table 17 above within the correct soil type and organic matter range. When applying SPARTAN 4F 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)

SPARTAN 4F may be applied preplant on the soil surface in the spring to control weeds in dry bean and dry peas. SPARTAN 4F 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 Spartan 4F to coarse textured soils with less than 1.5% organic matter wait a minimum of 7 days after application before planting. Spartan 4F can be tank mixed with other preemergence herbicides labeled for dry bean and dry peas use. If dry conditions persist following preemergence application of SPARTAN 4F a shallow incorporation may be needed to incorporate and activate the herbicide. If weeds are emerged at the time of SPARTAN 4F application use a burndown herbicide at the full labeled rate in combination with SPARTAN 4F or split application as needed.

Preplant Incorporated (PPI)

SPARTAN 4F may be applied as a Preplant Incorporated treatment in the spring prior to planting in reduced and conventional tillage dry bean and dry pea. Do not incorporate to depths greater than 2 inches. SPARTAN 4F use rates for PPI applications are similar to those used in preplant and preemergence applications. SPARTAN 4F can be tank mixed with other burndown or soil applied herbicides labeled for use in dry bean or dry pea. Use the listed rates of burndown herbicides or split applications as needed. Observe all precautions instructions and rotational cropping guidelines of each product's label when tank mixing including all references to potential carryover and crop injury warnings or restrictions.

Weeds Controlled

When applied according to directions SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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. SPARTAN 4F 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 SPARTAN 4F (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, SPARTAN 4F 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 SPARTAN 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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, nonbell, roselle, scarlet eggplant, sunberry, tomatillo, tomato, tree tomato, cultivars, varieties, and/or hybrids of these.

Table 18

SPARTAN 4F Herbicide Use Rate Table (Fruiting Vegetables, except cucurbits, and Okra)			
Preplant Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F Herbicide 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 lowest rates for pH greater than 7.0 within the rate range.

Preplant Applications

SPARTAN 4F Herbicide may be applied preemergence as a broadcast or banded treatment on fruiting vegetables. Applications must be made prior to transplant. SPARTAN 4F Herbicide can be tankmixed 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 product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Preplant Incorporated (PPI)

SPARTAN 4F Herbicide may be applied as a preplant incorporated treatment in the spring prior to transplanting tomatoes. Do not incorporate to depths greater than 2 inches. SPARTAN 4F Herbicide can be tankmixed 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. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Weeds Controlled

When applied according to directions, SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide (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, SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F Herbicide under specific local conditions.

Restrictions

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

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

HORSERADISH

Table 19

SPARTAN 4F Use Rate Table (Horseradish)			
Fall or Spring Early Preplant, Preemergence, and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F per acre		
% Organic Matter	Soil Texture		
	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.

SPARTAN 4F may be applied as an preplant preemerge 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)

SPARTAN 4F 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. SPARTAN 4F may be applied in the spring from 60 days prior to planting up to planting. SPARTAN 4F 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 SPARTAN 4F runoff from rain or snow that may occur following application. SPARTAN 4F may be tankmixed 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 SPARTAN 4F or split applications as needed. Observe all precautions, instructions, and rotational cropping guidelines of each product label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Preplant Incorporated (PPI)

SPARTAN 4F 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. SPARTAN 4F can be tankmixed with other burndown or soil applied herbicides labeled for use on horseradish. Use the listed rates of burndown herbicides or split applications as needed. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Pre Emergence (PRE)

SPARTAN 4F 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. SPARTAN 4F may be applied as a banded treatment into the row middles after crop emergence. Use the higher SPARTAN 4F rates on clay soils and/or soils with greater than 1% organic matter. SPARTAN 4F may be applied with other pesticides registered for use on horseradish.

Weeds Controlled

When applied according to directions, SPARTAN 4F will provide control of

Lambsquarters common	Pigweed redroot
Morningglory ivyleaf	Waterhemp common
Nutsedge yellow	Waterhemp tail

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 SPARTAN 4F (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, SPARTAN 4F 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 SPARTAN

4F Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions

Restrictions

Do not apply more than 8.0 fluid ounces (0.25 pound active) per acre of SPARTAN 4F per application or per twelve month period. The twelve month period is considered to begin upon the initial SPARTAN 4F 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

SPARTAN 4F Herbicide Use Rate Table (Melons)			
Preemergence Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F Herbicide 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

SPARTAN 4F Herbicide can be applied 48 hours prior to planting to anytime after planting but before seedlings have emerged. SPARTAN 4F Herbicide applied after crop emergence may cause severe injury to the crop. SPARTAN 4F Herbicide can be applied alone or in combination with other labeled melon herbicides. SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide 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, SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide (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, SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F Herbicide under specific local conditions.

Restrictions

Do not apply more than 8.0 ounces (0.25 pound active) per acre of SPARTAN 4F Herbicide per application or per twelve month period. The twelve month period is considered to begin upon the initial SPARTAN 4F 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

SPARTAN 4F Herbicide Use Rate Table (Strawberry)	
Preemergence Applications	
Broadcast Rate	Fluid Ounces SPARTAN 4F Herbicide 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 lowest rates for pH greater than 7.0 within the rate range

Preemergence

SPARTAN 4F Herbicide can be applied prior to planting and before seedlings have emerged. SPARTAN 4F Herbicide applied after crop emergence may cause severe injury to the crop. SPARTAN 4F Herbicide can be applied alone or in combination with other labeled strawberry herbicides. SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide will provide control of

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

Precautions

These Crop Specific Use directions are based upon the interactive effects of SPARTAN 4F Herbicide (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, SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F Herbicide under specific local conditions.

Restrictions

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

Spartan 4F Herbicide Use Rate Table (Succulent Lima Beans (Tennessee only)) Preemergence Applications			
Broadcast Rate	Fluid Ounces Spartan 4F Herbicide per acre		
% Organic Matter	Soil Texture		
	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)

Spartan 4F Herbicide 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 Spartan 4F Herbicide will provide control of

Copperleaf hophornbeam	Pigweed redroot
Morningglory entrelleaf	Pigweed smooth

Morningglory ivyleaf	
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Precautions

When applying Spartan 4F Herbicide 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 Spartan 4F Herbicide 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. Spartan 4F Herbicide 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 Spartan 4F Herbicide (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, Spartan 4F Herbicide 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 Spartan 4F Herbicide. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on Spartan 4F Herbicide 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 Spartan 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

Spartan 4F Herbicide Use Rate Table (Succulent Cowpeas (Tennessee only)) Preemergence Applications			
Broadcast Rate	Fluid Ounces Spartan 4F Herbicide 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

Spartan 4F Herbicide 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, Spartan 4F Herbicide will provide control of

Copperleaf hophornbeam	Pigweed redroot
Morningglory entireleaf	Pigweed smooth
Morningglory ivyleaf	

Precautions

When applying Spartan 4F Herbicide 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 Spartan 4F Herbicide 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. Spartan 4F Herbicide use rates should be reduced in those areas. If applying Spartan 4F 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 Spartan 4F Herbicide (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, Spartan 4F Herbicide 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 Spartan 4F Herbicide. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on Spartan 4F Herbicide 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 Spartan application.

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

Do not incorporate.

SUCCULENT PEAS (37.0)

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

Table 18

Spartan 4F Herbicide Use Rate Table (Succulent Peas) Preemergence Applications			
Broadcast Rate	Fluid Ounces Spartan 4F Herbicide per acre		
% Organic Matter	Soil Texture		
	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)

Spartan 4F Herbicide 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, Spartan 4F Herbicide will provide control of

Copperleaf hophornbeam	Pigweed redroot
Morningglory entireleaf	Pigweed smooth
Morningglory ivyleaf	

Precautions

When applying Spartan 4F Herbicide 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 Spartan 4F Herbicide 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. Spartan 4F Herbicide use rates should be reduced in those areas. If applying Spartan 4F 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 Spartan 4F Herbicide (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, Spartan 4F Herbicide 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 Spartan 4F Herbicide. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on Spartan 4F Herbicide 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 Spartan 4F Herbicide application.

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

Do not incorporate.

OIL CROPS

FLAX (38 0)

Table 23

SPARTAN 4F Herbicide Use Rate Table (Flax)			
Fall Early Preplant and Preemergence Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F Herbicide per acre		
% Organic Matter	Soil Texture		
	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 lowest 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)

SPARTAN 4F Herbicide may be applied in the fall as a preplant treatment to control or suppress weeds prior to planting flax the following spring SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide runoff from rain or snow melt that may occur following application If weeds are emerged at the time of SPARTAN 4F Herbicide application use a labeled burndown herbicide at the full labeled rate in combination with SPARTAN 4F Herbicide or a sequential application as needed Select the appropriate rate from the Table above within the correct soil type and organic matter range When applying SPARTAN 4F Herbicide 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)

SPARTAN 4F Herbicide may be applied preplant on the soil surface in the spring to control weeds in flax SPARTAN 4F Herbicide can be applied early preplant prior to planting up to 3 days after planting as a preemerge soil application if seedlings have not broken the soil surface and if the seed furrow is completely closed SPARTAN 4F Herbicide applied after crop emergence may cause severe injury to the crop For preemerge 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 SPARTAN 4F Herbicide can be applied alone or in combination with other labeled flax herbicides Always follow the most restrictive label when tank mixing SPARTAN 4F Herbicide may be followed by labeled postemergence flax herbicides for increased control of grass and broadleaf weeds If dry conditions persist following preemerge application of SPARTAN 4F Herbicide weed control may be poor If weeds are emerged at the time of SPARTAN 4F Herbicide application use a burndown herbicide at the full labeled rate in combination with SPARTAN 4F Herbicide or split application as needed When using SPARTAN 4F Herbicide in no till or minimum till cropping systems tank mix with an appropriate burndown herbicide for improved control of existing weeds

Preemergence

SPARTAN 4F Herbicide can be applied prior to planting to anytime after planting but before seedlings have emerged SPARTAN 4F Herbicide applied after crop emergence may cause severe injury to the crop SPARTAN 4F Herbicide can be applied alone or in combination with other labeled flax herbicides SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide in no till or minimum till cropping systems tank mix with an appropriate burndown herbicide for improved control of existing weeds

When applied according to directions SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide use rates should be reduced to 3 0 oz/A in those areas or SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide (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 SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F Herbicide under specific local conditions

Restrictions

Do not apply more than 12 ounces (0.375 pound active) per acre of SPARTAN 4F Herbicide per application or per twelve month period The twelve month period is considered to begin upon the initial SPARTAN 4F application
 Do not apply to frozen soils or existing snow cover to prevent SPARTAN 4F Herbicide 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

SPARTAN 4F Use Rate Table (Mint)			
For Dormant and New Planting Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F per acre		
% Organic Matter	Soil Texture		
	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 SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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

SPARTAN 4F may also be applied in tank mixtures with other products registered for use in mint

New Planting Applications

SPARTAN 4F 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 SPARTAN 4F Use Rate Table (Table 24) for the appropriate 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

When Applied according to directions SPARTAN 4F 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 SPARTAN 4F (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 SPARTAN 4F 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 SPARTAN

4F Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions

Restrictions

Apply SPARTAN 4F 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 SPARTAN 4F 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 trifoliate 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 mammoth blackberry marionberry mora mures deronce nectarberry Northern dewberry olallieberry Orgeon evergreen berry phenomenalberry rangeberry ravenberry rossberry 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 munties native currant partridgeberry phalsa pincherry rasperry 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

SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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 ai) per acre per twelve month period The twelve month period is considered to begin when the initial application of SPARTAN 4F is applied

For improved weed management SPARTAN 4F can be applied in a tank mixture with other preemergence and postemergence burndown herbicides Refer to the tank mix partner s 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 SPARTAN 4F 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 FMC recommendations

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

Band Width Feet	X	Broadcast Rate Per Acre	=	Band Rate
Row Width Feet				
Band Width Feet	X	Broadcast Volume Per Acre	=	Band Volume

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

SPARTAN 4F 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 1/2 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

SPARTAN 4F 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 1/2 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 1/2 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 SPARTAN 4F with a burndown herbicide and use an appropriate adjuvant when weeds are present at the time of application. Refer to the tank mix partner's 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 SPARTAN 4F is applied where heavy crop trash such as leaves and branches and/or weed residues exists. It is best to rake or blow off the leaves and trash when they fall and prior to the SPARTAN 4F 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 Powellii</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 spp</i>
Burclover California	<i>Medicago polymorpha</i>
Carpetweed	<i>Mollugo verticillata</i>
Cheatgrass	<i>Bromus tectorum</i>
Cheeseweed species	<i>Malva spp</i>
Chickweed common	<i>Stellaria media</i>
Clover species	<i>Trifolium spp</i>
Copperleaf hophornbeam	<i>Acalypha ostryeafolia</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>Verbesina encelioides</i>
Cupgrass wooly	<i>Enchloa 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>
Eveningprimrose cutleaf	<i>Oenothera laciniata</i>
Fescue Red	<i>Fetuca rubra</i>
Fiddleneck species	<i>Amsinckia spp</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>
Flixweed	<i>Descurainia sophia</i>
Foxtail bristly	<i>Setaria verticillata</i>
Foxtail grant	<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 angulata</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 spp</i>
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 spp</i>
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>
Orchardgrass	<i>Dactylis glomerata</i>
Panicum fall	<i>Panicum dichotomiflorum</i>
Pigweed prostrate	<i>Amaranthus blitoides</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>
Shepherdspurse	<i>Capsella bursa pastoris</i>
Sida prickly	<i>Sida spinosa</i>
Sida Southern	<i>Sida acuta</i>
Signalgrass broadleaf	<i>Bracharia platyphylla</i>
Smartweed PA (seedling)	<i>Polygonum pennsylvanicum</i>
Smellmellon	<i>Cucumis melo</i>
Sowthistle species	<i>Sonchus spp</i>
Srangeltop 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 PERENNIALSEDGE CONTROL INCLUDING NUTSEDGE

SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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 Sunnam	<i>Cyperus sunnamensis</i>
Sedge Texas	<i>Cyperus polystachyos</i>

Optimum control of purple nutsedge may be obtained using split applications of SPARTAN 4F. 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. SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F (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 SPARTAN 4F 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 SPARTAN 4F Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions FMC 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 SPARTAN 4F 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 SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide application per acre per 12 month period The twelve month period is considered to begin upon the initial SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide application per acre per 12 month period The twelve month period is considered to begin upon the initial SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide. 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 SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide application per acre per 12 month period. The twelve month period is considered to begin upon the initial SPARTAN 4F Herbicide 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)

SPARTAN 4F Herbicide 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. SPARTAN 4F Herbicide is formulated as flowable (suspension concentrate) containing four pounds of the active ingredient sulfentrazone per gallon.

The mode of action of SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide.

SPARTAN 4F 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 SPARTAN 4F herbicide at the listed use rates.

Table 25 Tolerant grasses

Grass Type	Maximum Use Rate For Single Application	
	Fluid Ounces SPARTAN 4F Per Acre	Pound Active Ingredient Per Acre
Cool Season Grasses		
Bentgrass creeping	4	0.125
Fescue fine (<i>Festuca rubra</i>) Fescue tall (<i>Festuca arundinacea</i>) Ryegrass perennial (<i>Lolium perenne</i>) Bluegrass Kentucky (<i>Poa pratensis</i>) Bluegrass Rough (<i>Poa trivialis</i>)	4.8	0.125 0.25
Warm Season Grasses		
Bahiagrass (<i>Paspalum notatum</i>) Buffalograss (<i>Buchloe dactyloides</i>) Carpentergrass (<i>Axonopus affinis</i>) Centipedegrass (<i>Eremochloa ophiuoides</i>) Kikuyugrass (<i>Pennisetum clandestinum</i>) Seashore Paspalum (<i>Paspalum vaginatum</i>) Zoysiagrass (<i>Zoysia japonica</i>) Bermudagrass (<i>Cynodon dactylon</i>)	8-12	0.25 0.375

Bermudagrass Hybrids (Cyn Bluegrass St Augustinegrass (Stenotaphrum secundatum)		
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Applications of SPARTAN 4F 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 or cultivars have been evaluated under treatment with SPARTAN 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions

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

Applications to Reseeded Overseeded or Sprigged Areas

Reseeding overseeding or sprigging may be done following SPARTAN 4F applications to turfgrasses. If reseeding overseeding or sprigging is done within 1 month following a SPARTAN 4F treatment, 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 SPARTAN 4F 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

SPARTAN 4F 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 SPARTAN 4F use rate from Table 25.

When applied as directed SPARTAN 4F 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>
Sedge cylindrical	<i>Cyperus retrorsus</i>
Sedge globe	<i>Cyperus globulosus</i>
Sedge Surinam	<i>Cyperus sunnamensis</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

SPARTAN 4F 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. SPARTAN 4F 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 Broadleaf Weeds

SPARTAN 4F herbicide will control or suppress the weeds listed in the broadleaf chart below when applied alone shortly after weeds have emerged. SPARTAN 4F 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 SPARTAN 4F use rate from Table 25. For optimum results, SPARTAN 4F applications should be made shortly after weeds have emerged.

SPARTAN 4F may be tankmixed 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 SPARTAN 4F will provide control or suppression of the following broadleaf weeds

Broadleaves	Scientific Names
Bittercress	<i>Cardamine spp</i>
Black Medic	<i>Medicago lupulina</i>
Buttercup	<i>Ranunculus spp</i>
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 spp</i>

Clover	<i>Trifolium spp</i>
Cudweed	<i>Gnaphalium spp</i>
Dandelion	<i>Taraxacum officinale</i>
Dock curly	<i>Rumex crispus</i>
Evening primrose	<i>Oenothera biennis</i>
Fiddleneck	<i>Amsinckia spp</i>
Filaree	<i>Erodium spp</i>
Garlic wild	<i>Allium vineale</i>
Goldenrod	<i>Solidago spp</i>
Ground ivy	<i>Glechoma hederacea</i>
Henbit	<i>Lamium amplexicaule</i>
Knotweed prostrate	<i>Polygonum aviculare</i>
Kochia	<i>Kochia scoparia</i>
Lambsquarters common	<i>Chenopodium album</i>
Lawn burweed	<i>Soliva pterosperma</i>
Lespedeza common	<i>Lespedeza striata</i>
Mallow common	<i>Malva neglecta</i>
Onion wild	<i>Allium canadense</i>
Parsley pier	<i>Achemilla arvensis</i>
Pigweed redroot	<i>Amaranthus retroflexus</i>
Pigweed tumble	<i>Amaranthus albus</i>
Pineapple weed	<i>Matricaria matricanodes</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>Sisymbrium irio</i>
Smartweed PA	<i>Polygonum pensylvanicum</i>
Sorrel red	<i>Rumex acetosella</i>
Speedwell	<i>Veronica spp</i>
Spurge annual	<i>Euphorbia spp</i>
Spurge prostrate	<i>Euphorbia humistrata</i>
Spurge spotted	<i>Euphorbia maculata</i>
Star of Bethlehem	<i>Ornithogalum 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 SPARTAN 4F per twelve month period. The twelve month period is considered to begin upon the initial SPARTAN 4F application.
- Sod production areas must be established three (3) months prior to the initial treatment of SPARTAN 4F.
- Do not apply SPARTAN 4F to turf grasses not listed on this label.
- Do not apply with surfactants.
- Do not graze or feed forage harvested from SPARTAN 4F treated areas.
- Do not apply to landscape ornamental plants or ornamental beds.
- Do not harvest sod within three (3) months of SPARTAN 4F 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 of 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

SPARTAN 4F Herbicide 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

SPARTAN 4F Herbicide 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

SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide to soils classified as sand with less than 1% Organic Matter

Use labeled rates of burndown herbicides such as glyphosate glyphosate trimesium diquat 2,4-D dicamba etc as tank mixtures with SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide 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	Desmodium tortuosum
Carpetweed	Mollugo verticillata
Chickweed common	Stellaria media
Copperleaf Hophornbeam	Acalypha ostryifolia
Crabgrass species	Digitaria spp
Croton tropic	Croton glandulosus
Daisy American	Coreopsis grandiflora
Dayflower common	Commelina communis
Dayflower Virginia	Commelina virginica
Dock curly	Rumex crispus
Fixweed	Descurainia Sophia
Galinsoga hairy	Galinsoga ciliata
Groundcherry clammy (seedling)	Physalis heterophylla
Groundcherry cutleaf	Physalis angulata
Jimsonweed	Datura stramonium
Kochia	Kochia scoparia
ALS/Triazene Resistant Kochia	Kochia scoparia
Lambsquarter common	Chenopodium album
Lettuce wild	Lactuca virosa
Mallow common	Malva neglecta
Milkweed honeyvine	Ampelamus albidus
Mexicanweed	Caperonia castanifolia
Morningglory species	Ipomoea spp
Mustard species	Brassica spp
Nightshade species	Solanum spp
Nutsedge species	Cyperus spp
Palmer amaranth	Amaranthus palmeri
Pigweed smooth	Amaranthus hybridus
Pigweed redroot	Amaranthus retroflexus
Texasweed	Caperonia palustris
Thistle Russian	Salsola iberica
Waterhemp tall	Amaranthus tuberculatus
Waterhemp common	Amaranthus rudis

Do not apply more than 12 fluid ounces (0.375 pound active) per acre of SPARTAN 4F Herbicide per twelve month period The twelve month period is considered to begin upon the initial SPARTAN 4F Herbicide application

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LABEL TRACKING INFORMATION

Label Code 072312

FMC Corporation

Agricultural Products Group
1735 Market Street
Philadelphia Pennsylvania 19103
215 299 6000

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Supplemental Labeling

SPARTAN 4F HERBICIDE

EPA Reg No 279-3220

This supplemental label expires July 31, 2015 and must not be used or distributed after this date

DIRECTIONS FOR USE

IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING ALL APPLICABLE DIRECTIONS, RESTRICTIONS AND PRECAUTIONS ON THE EPA REGISTERED LABEL ARE TO BE FOLLOWED

This Supplemental labeling must be in the possession of the user at the time of pesticide application Read the label affixed to the container for before applying Carefully follow all precautionary statements and application use directions Use of SPARTAN 4F HERBICIDE according to this labeling is subject to the use precautions and limitations imposed by the label affixed to the container for SPARTAN 4F HERBICIDE

CROP ROTATIONAL RESTRICTIONS

The following Table 4 shows the minimum interval in months from the time of the last Spartan 4F application until Spartan 4F treated soil can be replanted to the crops listed When Spartan 4F 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 Spartan 4F 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
Brassica leafy greens	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 Shell Peas and Beans	Anytime
Flax	Anytime
Fruting 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

ACCEPTED
with **COMMENTS**
in EPA Letter Dated
SEP 28 2012

Under the Federal In ticide
Fungicide and Rodenticide Act
as amended for the pesticide
registered under EPA Reg No

279-3220

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 80 oz/acre

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

SUNFLOWER SUBGROUP 20B

Calendula Castor oil plant Chinese tallowtree Euphorbia Evening primrose Jojoba Niger seed Rose hip Safflower Stokes aster Sunflower Tallowwood Tea oil plant Vernonia cultivars varieties and/or hybrids of these

Table 11

SPARTAN 4F Use Rate Table (Sunflower subgroup 20B)			
Fall Early Spring Preplant Preemergence and Preplant Incorporated Applications			
Broadcast Rate	Fluid Ounces SPARTAN 4F per acre		
% Organic Matter	Soil Texture		
	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	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)

SPARTAN 4F may be applied in the fall as a preplant treatment to control or suppress weeds prior to planting the following spring. SPARTAN 4F 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 SPARTAN 4F runoff from rain or snow melt that may occur following application. SPARTAN 4F 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 SPARTAN 4F application use a burndown herbicide such as glyphosate or paraquat at the full labeled rate in combination with SPARTAN 4F or split application as needed. Select the appropriate rate from Table 11 above within the correct soil type and organic matter range. When applying SPARTAN 4F 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)

SPARTAN 4F may be applied preplant on the soil surface in the spring to control weeds. SPARTAN 4F 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 Spartan 4F to coarse textured soils with less than 1.5% organic matter wait a minimum of 7 days after application before planting. SPARTAN 4F 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 SPARTAN 4F a shallow incorporation may be needed to incorporate and activate the herbicide. If weeds are emerged at the time of SPARTAN 4F application use a burndown herbicide at the full labeled rate in combination with SPARTAN 4F or split application as needed.

Preplant Incorporated (PPI)

SPARTAN 4F may be applied as a Preplant Incorporated treatment in the spring prior to planting in reduced and conventional tillage. SPARTAN 4F should be shallowly incorporated in the soil no deeper than 2 inches. Incorporating SPARTAN 4F deeper than 2 inches can result in inconsistent weed control. Use the appropriate rate from Table 11 above for the soil texture, organic matter, and pH level. SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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. SPARTAN 4F 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 SPARTAN 4F (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, SPARTAN 4F 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 SPARTAN 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions.

Restrictions

Do not apply more than 8.0 fluid ounces (0.25 pound active) of SPARTAN 4F per twelve month period to sunflowers. The twelve month period is considered to begin upon the initial SPARTAN 4F application.

Do not apply to frozen soils or existing snow cover to prevent SPARTAN 4F 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.

COWPEAS, SUCCULENT (TENNESSEE ONLY)

Table 23

Spartan 4F Herbicide Use Rate Table (Succulent Cowpeas (Tennessee only)) Preemergence Applications			
Broadcast Rate	Fluid Ounces Spartan 4F Herbicide per acre		
% Organic Matter	Soil Texture		
	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)

Spartan 4F Herbicide 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, Spartan 4F Herbicide will provide control of

Copperleaf hophornbeam	Pigweed redroot
Morningglory entireleaf	Pigweed smooth
Morningglory ivyleaf	

Precautions

When applying Spartan 4F Herbicide 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 Spartan 4F Herbicide 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. Spartan 4F Herbicide use rates should be reduced in those areas. If applying Spartan 4F 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 Spartan 4F Herbicide (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, Spartan 4F Herbicide 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 Spartan 4F Herbicide. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on Spartan 4F Herbicide 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 Spartan application.

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

Do not incorporate.

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 uniq 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 mammoth blackberry marionberry mora mures deronce nectarberry Northern dewberry olallieberry Orgeon evergreen berry phenomenalberry rangeberry ravenberry rossberry 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 muntries 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

SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F should be made at 4 to12 fl oz per acre (0 125 to 0 375 lb ai/A) Do not apply more than 12 fluid ounces (0 375 lb ai) per acre per twelve month period The twelve month period is considered to begin when the initial application of SPARTAN 4F is applied

For improved weed management SPARTAN 4F can be applied in a tank mixture with other preemergence and postemergence burndown herbicides Refer to the tank mix partner s 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 SPARTAN 4F 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 FMC recommendations

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

Band Width Feet	X	Broadcast Rate Per Acre	=	Band Rate
Row Width Feet				
Band Width Feet	X	Broadcast Volume Per Acre	=	Band Volume

A minimum of 10 gallons of spray solution per acre should be used to ensure uniform spray coverage Nozzle selection should meet manufacturer's spray volume and pressure recommendations for preemergence and postemergence herbicide applications The spray solution should have a pH between 5 0 and 9 0

SPARTAN 4F 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

SPARTAN 4F 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 1/2 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 1/2 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 SPARTAN 4F with a burndown herbicide and use an appropriate adjuvant when weeds are present at the time of application. Refer to the tank mix partner's 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 SPARTAN 4F 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 SPARTAN 4F 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 Powellii</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 spp</i>
Burclover California	<i>Medicago polymorpha</i>
Carpetweed	<i>Mollugo verticillata</i>
Cheatgrass	<i>Bromus tectorum</i>
Cheeseweed species	<i>Malva spp</i>
Chickweed common	<i>Stellaria media</i>
Clover species	<i>Trifolium spp</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>Verbesina encelioides</i>
Cupgrass wooly	<i>Enchloa villosa</i>
Cyperus hedgehog	<i>Cyperus compressus</i>
Daisy American	<i>Eclipta alba</i>
Devilscaw	<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>
Fiddleneck species	<i>Amsinckia spp</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>
Flixweed	<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 angulata</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 spp</i>
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 wrnghtii</i>
Morningglory purple	<i>Ipomoea turbinata</i>
Morningglory red	<i>Ipomoea coccinea L</i>
Morningglory scarlet	<i>Ipomoea coccinea</i>
Morningglory smallflower	<i>Jacquemontia tammifolia</i>
Morningglory tall	<i>Ipomoea purpurea</i>
Mullein turkey	<i>Eremocarpus setigerus</i>
Mustard Species	<i>Brassica spp</i>
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>
Orchardgrass	<i>Dactylis glomerata</i>
Panicum fall	<i>Panicum dichotomiflorum</i>
Pigweed prostrate	<i>Amaranthus blitoides</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>Calandnnia 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 pastons</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>
Sowthistle species	<i>Sonchus spp</i>
Srangletop 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>Linana vulgans</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 PERENNIALSEDGE CONTROL INCLUDING NUTSEDGE

SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F 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 Sunnam	<i>Cyperus surinamensis</i>
Sedge Texas	<i>Cyperus polystachyos</i>

Optimum control of purple nutsedge may be obtained using split applications of SPARTAN 4F. 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. SPARTAN 4F 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 SPARTAN 4F 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 SPARTAN 4F (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 SPARTAN 4F 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 SPARTAN 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on SPARTAN 4F under specific local conditions. FMC 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 SPARTAN 4F 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 SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide application per acre per 12 month period. The twelve month period is considered to begin upon the initial SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide will provide control of

Galinsoga hairy	Waterhemp common
Lambsquarters common	Waterhemp tall
Pigweed redroot	

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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 SPARTAN 4F Herbicide application per acre per 12 month period The twelve month period is considered to begin upon the initial SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide 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 SPARTAN 4F Herbicide application per acre per 12 month period The twelve month period is considered to begin upon the initial SPARTAN 4F Herbicide application

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

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Supplemental Labeling



4F Herbicide

ACCEPTED
with COMMENTS
in EPA Letter Dated
SEP 28 2012
Under the Federal Insecticide
Fungicide and Rodenticide Act
as amended for the pesticide
registered under EPA Reg. No.

279-3220

EPA Reg No 279-3220
Expiration Date SEP 28 2015

DIRECTIONS FOR USE

IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING. ALL APPLICABLE DIRECTIONS, RESTRICTIONS AND PRECAUTIONS ON THE EPA REGISTERED LABEL ARE TO BE FOLLOWED.

This Supplemental labeling must be in the possession of the user at the time of pesticide application. Read the label affixed to the container for Spartan 4F Herbicide before applying. Carefully follow all precautionary statements and application use directions.

VEGETABLE SOYBEAN (EDAMAME)

Spartan 4F Herbicide Use Rate Table (Edamame) Preemergence Applications			
Broadcast Rate	Fluid Ounces Spartan 4F Herbicide 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

Spartan 4F Herbicide may be applied to edamame 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.

Precautions

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. Spartan 4F Herbicide use rates should be reduced in those areas. If applying Spartan 4F 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 Spartan 4F Herbicide (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, Spartan 4F Herbicide 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 Spartan 4F Herbicide. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on Spartan 4F Herbicide 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 Spartan 4F Herbicide application.
- Do not apply to coarse soils classified as sand, which have less than 1% organic matter.
- Do not incorporate.



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