

## **ASPARAGUS - SPOT TREATMENT - ANNUAL WEEDS**

### General Information

#### GENERAL INFORMATION

DO NOT APPLY SHOWDOWN USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS AS SPECIFIED WITHIN THE LABEL OR CURRENT SUPPLEMENTAL LABELING ISSUED BY MANUFACTURER.

SHOWDOWN, a water soluble liquid, mixes readily with water to be applied as a foliar spray for the control or destruction of most herbaceous plants. It may be applied through most standard industrial or field-type sprayers after dilution and thorough mixing with water in accordance with label instructions. Hand-held sprayers may also be used.

SHOWDOWN moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days, but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of SHOWDOWN and delay visual effects of control. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

Unless otherwise specified on the label, delay application until vegetation has emerged and reached the stages described for control of such vegetation under the "WEEDS CONTROLLED" section of the label. Unemerged plants arising from unattached underground rhizomes or root stocks of perennials will not be affected by the herbicide and will continue to grow. For this reason, best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity.

Always use the higher rate of SHOWDOWN per acre within the recommended range when (1) weed growth is heavy or dense, or (2) weeds are growing in an undisturbed (noncultivated) area.

Reduced or unacceptable control may result if weeds or brush are treated under poor growing conditions such as drought stress, disease or insect damage. Reduced

results may also occur when treating weeds or brush heavily covered with dust.

Reduced control may result when applications are made to annual or perennial weeds that have been mowed, grazed, or cut, and have not been allowed to regrow to the recommended stage for treatment.

Rainfall or irrigation occurring within 6 hours after application may reduce effectiveness. Heavy rainfall or irrigation within 2 hours after application may wash the chemical off the foliage and a repeat treatment may be required.

SHOWDOWN does not provide residual weed control. For subsequent residual weed control, it is recommended that a residual herbicide program specified on the label be used. Read and carefully observe the precautionary statements and all other information appearing on the labels of all herbicides used.

Mixing SHOWDOWN with herbicides or other materials not recommended in the label may result in reduced performance. However, unless otherwise prohibited on the label or the label of an intended tank mix product, SHOWDOWN may be applied in combination with any herbicide registered for the same site, timing, and method of application. Observe the most restrictive label statements of various tank mix products used. LIABILITY FOR CROP INJURY, HERBICIDE NONPERFORMANCE OR OTHER LOSS OR DAMAGE RESULTING FROM A TANK MIXTURE NOT SPECIFIED ON THE LABEL, OR SUPPLEMENTAL LABELING DISTRIBUTED FOR SHOWDOWN, IS SPECIFICALLY DISCLAIMED BY MANUFACTURER. BUYER AND ALL USERS ARE RESPONSIBLE FOR ALL LOSS OR DAMAGE IN CONNECTION WITH THE USE OR HANDLING OF MIXTURES OF SHOWDOWN OR OTHER MATERIALS THAT ARE NOT EXPRESSLY RECOMMENDED IN THE LABEL.

For best results, spray coverage should be uniform and complete. Do not spray weed foliage to the point of runoff.

**DOMESTIC ANIMALS:** SHOWDOWN is considered to be relatively nontoxic to dogs and other domestic animals; however, ingestion of SHOWDOWN or large amounts of freshly sprayed vegetation may result in temporary gastrointestinal irritation (vomiting, diarrhea, colic, etc.). If such symptoms are observed, provide the animal with plenty of fluids to prevent dehydration. Call a veterinarian if symptoms persist for more than 24 hours.

## ATTENTION

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING SHOWDOWN TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of SHOWDOWN can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of injury occurring from the use of SHOWDOWN is greatest when winds are gusty or in excess of 5 miles per hour or when other conditions, including lesser wind velocities, will allow spray drift to occur. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

NOTE: Use of SHOWDOWN in any manner not consistent with the label may result in injury to persons, animals or crops, or other unintended consequences. When not in use, keep container closed to prevent spills and contamination.

## APPLICATION EQUIPMENT AND TECHNIQUES

Do not apply SHOWDOWN through any type of irrigation system.

SHOWDOWN may be applied with the following application equipment:

Aerial - Fixed Wing and Helicopter

Broadcast Spray

Controlled Droplet Applicator (CDA) - Hand-held or boom-mounted applicators which produce a spray consisting of a narrow range of droplet sizes.

Hand-Held and High-Volume Spray Equipment - Knapsack and backpack sprayers, pump-up pressure sprayers, handguns, handwands, mistblowers, lances and other hand-held and motorized spray equipment used to direct the spray onto weed foliage. SHOWDOWN is not registered in California or Arizona for use in mistblowers.

Selective Equipment - Recirculating sprayers, shielded sprayers and wiper applicators. See the appropriate part of this section for specific instructions and rates of application.

## AERIAL EQUIPMENT

Use the recommended rates of this herbicide in 3 to 15 gallons of water per acre unless otherwise specified on the label. See the "WEEDS CONTROLLED" section of the label for specific rates. Unless otherwise specified, do not exceed 1 quart per acre. Aerial applications of SHOWDOWN may be made in annual cropping conventional tillage systems, fallow and reduced tillage systems, Roundup Ready crops, noncrop areas and preharvest applications. Refer to the individual use area sections of the label for recommended volumes and application rates. For specific state information, consult following section and State pesticide regulatory agency.

## STATE INFORMATION ON AERIAL APPLICATIONS

### ARKANSAS:

AVOID DRIFT. DO NOT APPLY INTO STILL AIR WHERE THERE IS A TEMPERATURE INVERSION LAYER LOW ENOUGH FOR FINE SPRAY PARTICLES TO BECOME SUSPENDED AND MOVE OUTSIDE THE TARGET AREA WHEN THE INVERSION LAYER MOVES. DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION THAT FAVORS DRIFT. DRIFT IS LIKELY TO CAUSE DAMAGE TO ANY VEGETATION CONTACTED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Use the recommended rate of SHOWDOWN in 3 to 15 gallons of water per acre.

Use sufficient carrier volume and appropriate equipment set-up to form droplets large enough to avoid drift potential. Coarse droplets in the 300 to 500 (VMD) micron range are recommended.

Applications should typically be made with the nozzle release point at 8 to 15 feet above the top of the target plants unless a greater height is required for aircraft safety.

The distance of the outermost nozzles on the boom must not exceed 75% of the length of the wingspan or rotor. In many cases, reducing this distance to 65% of the length of the wingspan or rotor will improve drift control without affecting the swath width. Nozzles must always discharge backward parallel with the airstream and never discharge downwards more than 45 degrees on fixed wing aircraft or forward of the prevailing air flow on rotary winged aircraft. Avoid the use of nozzles with

wide angle discharge. Do not apply SHOWDOWN when winds are in excess of 10 miles per hour.

Do not apply when there is a low-level inversion where fine spray particles could be suspended in still air and move outside the target area when the inversion layer moves. These conditions may occur when wind speeds are less than 2 mph.

Use the following guidelines when applications are made near crops or other desirable vegetation:

1. Do not apply within 100 feet of any desirable vegetation or crops.
2. If wind up to 5 miles per hour is blowing toward desirable vegetation or crops, do not apply within 500 feet of the desirable vegetation or crops.
3. Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crops will likely require buffer zones in excess of 500 feet.

CALIFORNIA - Statewide:

Aerial applications of SHOWDOWN are allowed in the following situations:

1. In fallow and reduced tillage systems prior to the emergence or transplanting of labeled crops.
2. In cotton, prior to harvest. Refer to the specific preharvest application instructions.

Do not plant subsequent crops other than those listed in the label booklet for SHOWDOWN for 30 days following application.

When applied as recommended, under the conditions described, SHOWDOWN controls annual and perennial weeds listed in the label. **DO NOT EXCEED A MAXIMUM RATE OF 2 QUARTS PER ACRE OF SHOWDOWN WHEN MAKING APPLICATIONS BY AIR IN FALLOW AND REDUCED TILLAGE SYSTEMS.**

**DO NOT EXCEED A MAXIMUM RATE OF 1 QUART PER ACRE OF SHOWDOWN WHEN MAKING APPLICATIONS BY AIR IN COTTON, PRIOR TO HARVEST.**

Use the recommended rates of SHOWDOWN in 3 to 15 gallons of water per acre.

Do not apply directly to water, to areas where surface water is present or to

intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

**AVOID DRIFT - DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH WILL ALLOW DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.**

Use the following guidelines when aerial applications are made near crops or desirable perennial vegetation after bud break and before total leaf drop, and/or near other desirable vegetation or annual crops.

1. Do not apply within 100 feet of all desirable vegetation or crop(s).
2. If wind up to 5 miles per hour is blowing toward desirable vegetation or crop(s), do not apply within 500 feet of the desirable vegetation or crop(s).
3. Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crop(s) may require buffer zones in excess of 500 feet.
4. Do not apply when winds are in excess of 10 miles per hour or when inversion conditions exist. Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations which dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase nozzle pressure.

Drift control additives may be used. When a drift control additive is used, read and carefully observe the cautionary statements and all other information and all other information appearing on the additive label.

Ensure uniform application - To avoid streaked, uneven or overlapped application, use appropriate marking devices.

**CALIFORNIA - Fresno County:** This section applies to aerial applications in Fresno County from February 15 through March 31 only. For aerial application outside of these dates, refer to the "CALIFORNIA - Statewide" section.

**APPLICABLE AREA:** This supplement only applies to the area contained inside the following boundaries within Fresno County, California only. North: Fresno County line; South: Fresno County line; East: State Highway 99; West: Fresno County line.

**GENERAL INFORMATION:** Always read and follow the label directions and precautionary statements for all products used in the aerial application. Observe the following directions to minimize off-site movement during aerial application of this herbicide. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor, and aerial applicator.

**WRITTEN RECOMMENDATIONS:** A written recommendation **MUST** be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. This written recommendation **MUST** state the proximity of surrounding crops, and that conditions of each manufacturer's applicable product label(s) and the label have been satisfied.

**AERIAL APPLICATOR TRAINING AND EQUIPMENT:** Aerial application of this herbicide is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight, and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved "fly-ins" constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

**APPLICATION AT NIGHT:** Do not apply SHOWDOWN by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

To report known or suspected misuse of SHOWDOWN, or for additional information on the proper aerial application of SHOWDOWN, call 1-800-852-5234.

Avoid direct application to any body of water.

AVOID DRIFT - DO NOT APPLY DURING LOW-LEVEL INVERSION CONDITIONS, WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH FAVORS DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations which dispense spray as fine spray droplets.

Do not angle nozzles forward into the airstream, and do not increase spray volume by increasing nozzle pressure above the manufacturer's recommendation.

Drift control additives may be used. When a drift control additive is used, read and carefully observe the precautionary statements and all other information appearing on the additive label.

#### BROADCAST EQUIPMENT

For control of annual or perennial weeds listed on the label using broadcast equipment - Use the recommended rates of SHOWDOWN in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified on the label. See the "WEEDS CONTROLLED" section of the label for specific rates. As density of weeds increases, spray volume should be increased within the recommended range to ensure complete coverage. Carefully select proper nozzle to avoid spraying a fine mist. For best results with ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

#### CONTROLLED DROPLET APPLICATION (CDA)



The rate of SHOWDOWN applied per acre by vehicle-mounted CDA equipment must not be less than the amount recommended in the label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply 3 to 15 gallons of water per acre. For the control of labeled annual weeds with hand-held CDA units, apply a 20 percent solution of SHOWDOWN at a flow rate of 2 fluid ounces per minute and a walking speed of 1.5 MPH (1 quart per acre). For the control of labeled perennial weeds, apply a 20 to 40 percent solution of SHOWDOWN at a flow rate of 2 fluid ounces per minute and a walking speed of 0.75 mph (2 to 4 quarts per acre).

Controlled droplet application equipment produces a spray pattern which is not easily visible. Extreme care must be exercised to avoid spray or drift contacting the foliage or any other green tissue of desirable vegetation, as damage or destruction may result.

#### HAND-HELD and HIGH-VOLUME EQUIPMENT

Use Coarse Sprays Only.

Mix SHOWDOWN in clean water and apply to foliage of vegetation to be controlled. For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff. For control of annual weeds listed on the label, apply a 0.5 percent solution of SHOWDOWN plus nonionic surfactant to weeds less than 6 inches in height or runner length. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds. Allow three or more days before tillage or mowing. For annual weeds over 6 inches tall, use a 1 percent solution. For best results, use a 2 percent solution on harder-to-control perennials, such as bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

When using application methods which result in less than complete coverage, use a 5 percent solution for annual and perennial weeds and a 5 to 10 percent solution for woody brush and trees.

#### SELECTIVE EQUIPMENT

SHOWDOWN may be applied through a recirculating spray system, a shielded applicator, or a wiper applicator after dilution and thorough mixing with water to

listed weeds growing in any noncrop site specified on the label and only when specifically recommended in cropping systems.

- A recirculating spray system directs the spray solution onto weeds growing above desirable vegetation, while spray solution not intercepted by weeds is collected and returned to the spray tank for reuse.
- A shielded applicator directs the herbicide solution onto weeds, while shielding desirable vegetation from the herbicide.
- A wiper applicator applies the herbicide solution onto weeds by rubbing the weed with an absorbent material containing the herbicide solution.

#### AVOID CONTACT WITH DESIRABLE VEGETATION.

Contact of the herbicide solution with the desirable vegetation may result in damage or destruction. Applicators used above desired vegetation should be adjusted so that the lowest spray stream or wiper contact point is at least 2 inches above the desirable vegetation. Droplets, mist, foam, or splatter of the herbicide solution settling on desirable vegetation may result in discoloration, stunting or destruction.

Applications made above the crops (such as wiper applications) should be made when the weeds are a minimum of 6 inches above the desirable vegetation. Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations or when the height of the weeds varies so that not all weeds are contacted. In these instances, repeat treatment may be necessary.

#### SHIELDED APPLICATORS

When applied as directed under conditions described for shielded applicators, SHOWDOWN will control those weeds listed in the "WEEDS CONTROLLED" section of the label.

Use the equation to convert from a broadcast rate per acre to a band rate per acre. (Refer to the label)

Use nozzles that provide uniform coverage within the treated area. Keep shields on

shielded sprayers adjusted to protect desirable vegetation. EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT WITH DESIRABLE VEGETATION.

For specific rates of application and instructions for control of various annual and perennial weeds, see the "WEEDS CONTROLLED" section of the label.

## WIPER APPLICATORS

Wiper applicators are devices that physically wipe appropriate amounts of SHOWDOWN directly onto the weed. Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation. Operate this equipment at ground speeds no greater than 5 mph. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if 2 applications are made in opposite directions.

Avoid leakage or dripping onto desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Keep wiping surfaces clean. Be aware that, on sloping ground, the herbicide solution may migrate, causing dripping on the lower end and drying of the wicks on the upper end of a wiper applicator.

Do not use wiper equipment when weeds are wet.

Mix only the amount of solution to be used during a 1-day period, as reduced activity may result from use of leftover solutions. Clean wiper parts immediately after using SHOWDOWN by thoroughly flushing with water.

Do not add surfactant to the herbicide solution.

For Rope or Sponge Wick Applicators - Mix 1 gallon of SHOWDOWN in 2 gallons of water to prepare a 33-percent solution. Apply this solution to weeds listed in this "WIPER APPLICATORS" section.

For Porous-Plastic Applicators - Solutions ranging from 33 to 100 percent of SHOWDOWN in water may be used in porous-plastic wiper applicators.

## WEEDS CONTROLLED

SHOWDOWN controls many annual and perennial grasses and broadleaf weeds.

## ANNUAL WEEDS

- Apply to actively growing grass and broadleaf weeds.
- Allow at least 3 days after treatment before tillage.
- For maximum agronomic benefit, apply when weeds are 6 inches or less in height.
- To prevent seed production, applications should be made prior to seedhead formation.
- SHOWDOWN does not provide residual control; therefore, delay application until maximum weed emergence. Repeat treatments may be necessary to control later germinating weeds.

## LOW-VOLUME BROADCAST APPLICATION (LOW-RATE TECHNOLOGY)

When applied as directed under the conditions described, SHOWDOWN will control the weeds listed below when:

1. Water carrier volumes of 3 to 10 gallons per acre for ground applications and 3 to 5 gallons per acre for aerial applications are recommended. (See the "AERIAL APPLICATION" section of the label for approved sites.)
2. A nonionic surfactant is added at 0.375 percent by total spray volume.

## NOTE

The addition of 2 percent dry ammonium sulfate by weight or 17 pounds per 100 gallons of water may increase the performance of SHOWDOWN on annual weeds. The improvement in performance may be apparent where environmental stress is a concern. Refer to the "MIXING, ADDITIVES and APPLICATION INSTRUCTIONS" section of the label.

- Do not tank-mix with soil residual herbicides when using these rates unless otherwise specified.
- For weeds that have been mowed, grazed or cut, allow regrowth to occur prior to treatment.
- Refer to the "TANK MIXTURES" portion of this section for control of additional

broadleaf weeds.

## HIGH-VOLUME BROADCAST APPLICATIONS

When applied as directed under the conditions described, SHOWDOWN will control the weeds listed below when water carrier volumes are 10 to 40 gallons per acre for ground applications.

Apply 1 to 1.5 quarts of SHOWDOWN per acre plus 0.375 percent nonionic surfactant by total spray volume per acre to control the following annual broadleaf weeds when less than 6 inches in height. Use 1 quart per acre if weeds are less than 6 inches tall and 1.5 quarts per acre if weeds are over 6 inches tall. If weeds have been mowed, grazed or cut, allow adequate time for new growth to reach recommended stages prior to treatment. These rates will also provide control of weeds listed in the "LOW-VOLUME BROADCAST APPLICATION" section.

## PERENNIAL WEEDS

Apply SHOWDOWN as follows to control or destroy most perennial weeds:

NOTE: If weeds have been mowed or tilled, do not treat until plants have resumed active growth and have reached the recommended stages. Repeat treatments may be necessary to control weeds regenerating from underground parts or seed. Repeat treatments must be made prior to crop emergence.

The addition of 1 to 2 percent dry ammonium sulfate by weight or 8.5 to 17 pounds per 100 gallons of water may increase the performance of SHOWDOWN on perennial weeds. The improvement in performance may be apparent where environmental stress is a concern. Refer to the "MIXING, ADDITIVES and APPLICATION INSTRUCTIONS" section of the label.

## Limitations, Restrictions, and Exceptions

### ASPARAGUS

When applied as directed for "CROPPING SYSTEMS" under the conditions described, the product controls weeds listed on the label in asparagus.

For specific rates of applications and instructions for control of various annual and perennial weeds, see the “WEEDS CONTROLLED” section of the label.

Spot Treatment - Apply the product immediately after cutting, but prior to the emergence of new spears. Do not treat more than 10 percent of the total field area to be harvested. Do not harvest within 5 days of treatment.

NOTE: Select and use recommended types of spray equipment for postemergence postharvest applications. A directed spray is any application where the spray pattern is aligned in such a way as to avoid direct contact of the spray with the crop. A shielded spray is any application where a physical barrier is positioned and maintained between the spray and the crop to prevent contact of spray with the crop.

#### ANNUAL WEEDS

- Apply to actively growing grass and broadleaf weeds.
- Allow at least 3 days after treatment before tillage.
- For maximum agronomic benefit, apply when weeds are 6 inches or less in height.
- To prevent seed production, applications should be made prior to seedhead formation.
- The product does not provide residual control; therefore, delay application until maximum weed emergence.

Repeat treatments may be necessary to control later germinating weeds.

#### LOW-VOLUME BROADCAST APPLICATION (LOW-RATE TECHNOLOGY)

When applied as directed under the conditions described, the product will control the weeds listed below when:

1. Water carrier volumes of 3 to 10 gallons per acre for ground applications and 3 to 5 gallons per acre for aerial applications are recommended. (See the “AERIAL APPLICATION” section of the label for approved sites.)

The addition of 2 percent dry ammonium sulfate by weight or 17 pounds per 100 gallons of water may increase the performance of the product on annual weeds. The

improvement in performance may be apparent where environmental stress is a concern. Refer to the “MIXING, ADDITIVES and APPLICATION INSTRUCTIONS” section of the label.

- Do not tank-mix with soil residual herbicides when using these rates unless otherwise specified.
- For weeds that have been mowed, grazed or cut, allow regrowth to occur prior to treatment.
- Refer to the “TANK MIXTURES” portion of this section for control of additional broadleaf weeds.

Refer to annual weeds rate section for specific instructions.

Method

[Broadcast/Foliar Air](#)

[Broadcast/Foliar Ground](#)

[Spot treatment](#)

Rates

[field rates 0](#)

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Timings

[Immediately after cutting, but prior to the emergence of new spears](#)