

# Roundup® Brand Agricultural Herbicide Application Reminders

Roundup® brand agricultural herbicides need to get on the plant, in the plant, and through the plant for good weed control. In other words, they need good coverage, absorption, and translocation. The following are some reminders and considerations when using Roundup brand agricultural herbicides.

## Coverage, Absorption, and Translocation.

Coverage is often compromised by the weed or crop canopy. Coverage can be improved by choosing the proper nozzles, adjusting the boom height, and spraying at an appropriate ground speed. Use of spray volumes that range from 10 to 20 gallons per acre generally provides good coverage on target weeds.

Weeds need to be actively growing for good absorption and translocation of the herbicide. Environmental conditions can affect absorption and translocation. Dry weather causes weeds to have thickened cuticles, which are harder for herbicides to penetrate. Dry weather can also increase dust that can bind with glyphosate, the active ingredient in Roundup brand agricultural herbicides, making it less available for absorption into the plant. Adjusting the rate and using the proper additives can help under these conditions.

Translocation requires actively growing weeds with a good plumbing system, the xylem and phloem. Mechanical damage from tillage, planting or spray equipment can compromise the plumbing. Tillage that injures but does not kill the weeds can make them appear shorter than they are because much of the plant is below the soil surface. Planters and drills can cause the same effect. Lack of weed control in sprayer tracks can be due to a plant's restricted plumbing system, the presence of dust. Stem boring insects can also damage the plumbing, restricting translocation. When weeds injured by stem boring insects have been sprayed with a Roundup brand agricultural herbicide, the portion of the plant above the insect damage should die. Below the insect damage, the weed remains green and it may regrow. Giant Ragweed is one example of a weed where this has been noticed.

**Table 1.** General recommended rates of Roundup brand agricultural herbicides for various weed heights.

Weed Height (inches)	Rate (oz. / acre)
4 inches or less	22
4 inches to 12 inches	32
> 12 inches	44

For water carrier volumes between 15 and 40 gallons per acre.

## Use the Right Rate.

The rate for the field should be determined by the largest weed or the most difficult to control weed, not the most prevalent. If the field has predominantly 4 to 5 inch velvetleaf, but also contains a fair amount of 11 inch lambsquarters, the recommended rate would be 32 oz/acre due to the height of the lambsquarters (Table 1).

Annual weeds that are older and more mature or hardened-off may require 44 oz/acre even if they are less than 12 inches tall. Environmental stress, such as dry weather, can cause weeds to be short for their age, requiring a higher rate for good control. Tough to control annual weeds like common and giant ragweed and perennial weeds generally require the higher rates of 32 to 44 oz/acre. Check the Roundup brand agricultural herbicide label for application restrictions, and use full rates to achieve complete control of existing weeds.

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Maximum labeled rates & application recommendations	Single in-crop applications	Total in-crop applications	Postemergence applications	Overt-the-top broadcast applications	Drop Nozzles
<b>ROUNDUP READY® CORN 2</b>	Should not exceed 32/oz acre.	Should not exceed 64/oz acre.	Can be made up to 48 inch corn.	Can be made from emergence through V8 or until corn reaches 30 inches, whichever comes first.	*Can be made from emergence through V8 or until corn reaches 30 inches, whichever comes first.
<b>ROUNDUP READY® SOYBEANS &amp; GENUITY® ROUNDUP READY 2 YIELD®</b>	Should not exceed 44 /oz acre.	Should not exceed 64/oz acre.	Should exceed 22/oz acre.	Can be made form cracking through flowering (R2 stage soybeans)	NA

\*For corn heights of 30 to 48 inches, drop nozzles are required and should be kept below the crop canopy.



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### Ammonium Sulfate (AMS).

AMS conditions hard water and can be added to the tank at 8.5 to 17 pounds (1-2% by weight) of spray grade AMS or 2.5 to 5 gallons of liquid AMS per 100 gallons spray solution. Additional non-ionic surfactant can also be added to Roundup PowerMAX® herbicide at 1 to 2 quarts per 100 gallons spray solution to improve control.

### Making Re-treatments.

When re-treatment is necessary, allow time for weeds to recover and resume growth. Use the right rate of Roundup brand agricultural herbicide, considering weeds are older, taller, and will probably be even more difficult to control. If sprayer tracks were the problem, avoid the previous tracks. Weeds need to be actively growing for the best results.

### Tank Mixtures.

Roundup brand agricultural herbicide labels include approved tank-mix partners. Tank mixtures that could cause antagonism and reduce the effectiveness of Roundup brand agricultural herbicide should be avoided. Tank mixing with insecticides, fungicides, and nutrients or foliar fertilizers is generally not recommended.

### Application Timing.

The timing of weed control affects yield potential. Weeds should be controlled prior to 4 inches to help maximize yield potential. As the season progresses, it is also important to remember the label restrictions for maximum rates and growth stages for Roundup Ready® Corn 2 and soybeans.

### Herbicide Mixing Order It does matter...

1. Tank should be filled 2/3 with water.
2. Ammonium sulfate (AMS) should be added allowing it to fully dissolve to tie up any hard water ions.
3. Any dry formulations, suspensions, wettable powders, or flowables should be added, and should be agitated to fully dissolve any dry products.
4. Drift reduction agents should be added.
5. Water soluble formulations (liquids) should be added.
6. Finally, Roundup® Brand Agricultural Herbicides should be added. If using Roundup PowerMAX®, non-ionic surfactant can be added last.

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Roundup Technology® includes Monsanto's glyphosate-based herbicide technologies. Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

**ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Roundup Ready® crops contain genes that confer tolerance to glyphosate, the active ingredient in Roundup® brand agricultural herbicides. Roundup® brand agricultural herbicides will kill crops that are not tolerant to glyphosate. **Tank mixtures:** The applicable labeling for each product must be in the possession of the user at the time of application. Follow applicable use instructions, including application rates, precautions and restrictions of each product used in the tank mixture. Monsanto has not tested all tank mix product formulations for compatibility or performance other than specifically listed by brand name. Always predetermine the compatibility of tank mixtures by mixing small proportional quantities in advance. Genuity®, Roundup Ready 2 Yield®, Roundup PowerMAX®, Roundup Ready PLUS™, Roundup Ready®, Roundup Technology®, Roundup WeatherMAX and Design®, Roundup®, Technology Development by Monsanto and Design®, and Transorb and Design® are trademarks of Monsanto Technology LLC. ©2011 Monsanto Company. 07142011TED

