

Amounts of Solubor® to mix into spray tanks to supply desired boron rates

- Foliar applications of boron generally are more effective than soil applications in supplying sufficient boron for flowering and reproductive development in crops.
- *Solubor*® is highly water soluble, and is commonly applied in foliar sprays. It is also compatible with most pesticides, so it also can be applied in these sprays.
- Because the season for the most effective foliar application of boron is short, foliar sprays must be prepared quickly and accurately.
- Tables listing the amounts of *Solubor*® to mix in spray tanks to supply several commonly used boron application rates are shown below.

Boron (B) needs for plant growth and development can be supplied as *Granubor*® 2 applied preplant to the soil or as *Solubor*® foliar sprays during the season.

Foliar spray applications generally are more effective per unit of B than soil applications for most crops. The applied B is quickly absorbed by the leaves and other tissues and is immediately available for vegetative and reproductive growth.

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Foliar sprays are especially important for those plant species in which B is immobile; B uptake from the soil is insufficient to supply these plant's needs at critical periods of growth and reproductive development.

Research results have shown that foliar sprays of B applied just prior to and during bud formation and flowering have increased yields of numerous fruit and grain crops. Boron does not readily move from other parts of the plants to buds and flowers when it is needed for pollen tube growth, pollen production, bloom retention and seed development.

Responses to foliar B sprays may occur even when soil and leaf tissue analyses show adequate B levels, especially in those plant species in which B is immobile.

Proper timing of foliar sprays is essential to ensure that B is applied when the need is most critical. The B fertilizer must be on site, the sprayer must be ready to go and procedures should be in place to keep the sprayer operating during the busy season. Applying the recommended B rate is critical to obtaining optimum crop yields.

Solubor® is highly water soluble and commonly applied in foliar sprays. It is also compatible with most herbicides and insecticides, so they also can be applied in these sprays. This saves separate application costs.

Buffering agents may be needed when *Solubor*® is applied with some pesticides whose effectiveness is pH-sensitive. However, the cost per acre of buffers is minor relative to the cost of the pesticides.

The suggested order of mixing foliar sprays containing *Solubor*® alone or in combination with pesticides is shown in the following chart.

Suggested mixing order	
<i>Solubor</i>® sprays: <ol style="list-style-type: none"> 1. Fill the tank about half full with water. 2. Slowly add <i>Solubor</i>® with agitation. 3. Top off the tank with water and agitate for 3 - 5 minutes before spraying. 	<i>Solubor</i>® in combination with pesticide sprays: <ol style="list-style-type: none"> 1. Fill the tank about half full with water. 2. Slowly add <i>Solubor</i>® with agitation. 3. Slowly add the pesticide with continued agitation. 4. Add a buffering agent if the efficacy of the given pesticide is pH-sensitive. 5. Top off the tank with water and agitate for 3 - 5 minutes before spraying.

Calculations

The amount of *Solubor*® to mix in the tank to supply a desired B rate requires knowledge of the spray rate, the tank size of the sprayer, and the B concentration in the fertilizer. This calculation is:

The amount of *Solubor*® to mix in the spray tank = [(tank size ÷ spray rate) x desired B rate] ÷ B concentration in *Solubor*®.

Example

How much *Solubor*® (20.5% B) should be mixed in a 400-gallon tank with a spray rate of 20 gallons/acre to supply 0.25 lbs. of B/acre?

- Spray coverage of a full tank: 400 gallons ÷ 20 gallons/acre = 20 acres.
- Amount of B needed in the spray tank: 20 acres x 0.25 lbs. of B/acre = 5.0 lbs. of B.
- Amount of *Solubor*® required: 5.0 lb. ÷ 0.205 = 24.4 lbs. of *Solubor*®.

Tables 1-3 give the amounts of *Solubor*® (20.5% B) to mix in sprayers with various tank sizes and spray rates to supply three commonly used B application rates. The data in these tables has been rounded to the nearest pound of *Solubor*®.

Mixing more precise amounts would require a recalculation using the equation given above. A footnote is included in each table for making calculations when spray tanks are larger than 400 gallons.

**Table 1: Amounts of Solubor® (20.5% B) to mix in spray tanks
to supply 0.1 lb. of B/acre at various spray rates***

	Size of tank, gallons							
	100	250	500	400	600	800	1000	1200
	pounds of Solubor® required							
10	4.9	12.2	24.4	19.5	29.3	39.0	48.8	58.5
15	3.3	8.1	16.3	13.0	19.5	26.0	32.5	39.0
20	2.4	6.1	12.2	9.8	14.6	19.5	24.4	29.3
25	2.0	4.9	9.8	7.8	11.7	15.6	19.5	23.4
30	1.6	4.1	8.1	6.5	9.8	13.0	16.3	19.5
40	1.2	3.0	6.1	4.9	7.3	9.8	12.2	14.6
50	1.0	2.4	4.9	3.9	5.9	7.8	9.8	11.7

**Table 2: Amounts of Solubor® (20.5% B) to mix in spray tanks
to supply 0.25 lb. of B/acre at various spray rates***

	Size of tank, gallons							
	100	250	500	400	600	800	1000	1200
	pounds of Solubor® required							
10	12.2	30.5	61.0	48.8	73.2	97.6	122.0	146.3
15	8.1	20.3	40.7	32.5	48.8	65.0	81.3	97.6
20	6.1	15.2	30.5	24.4	36.6	48.8	61.0	73.2
25	4.9	12.2	24.4	19.5	29.3	39.0	48.8	58.5
30	4.1	10.2	20.3	16.3	24.4	32.5	40.7	48.8
40	3.0	7.6	15.2	12.2	18.3	24.4	30.5	36.6
50	2.4	6.1	12.2	9.8	14.6	19.5	24.4	29.3

**Table 3: Amounts of Solubor® (20.5% B) to mix in spray tanks
to supply 0.5 lb. of B/acre at various spray rates***

	Size of tank, gallons							
	100	250	500	400	600	800	1000	1200
	pounds of Solubor® required							
10	24.4	61.0	122.0	97.6	146.3	195.1	243.9	292.7
15	16.3	40.7	81.3	65.0	97.6	130.1	162.6	195.1
20	12.2	30.5	61.0	48.8	73.2	97.6	122.0	146.3
25	9.8	24.4	48.8	39.0	58.5	78.0	97.6	117.1
30	8.1	20.3	40.7	32.5	48.8	65.0	81.3	97.6
40	6.1	15.2	30.5	24.4	36.6	48.8	61.0	73.2
50	4.9	12.2	24.4	19.5	29.3	39.0	48.8	58.5

*For tank sizes greater than 400 gallons, add the amounts of Solubor® for the desired spray rate from those columns which will add up to the size of a larger spray tank.

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