

FERTILIZER SALT INDEX



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Fact Sheet No. 15 Revised 05/2002 Virtually all fertilizer materials are salts. When they dissolve in the soil they increase the salt concentration of the soil solution. An increase in salt concentration increases the osmotic potential of the soil solution. The higher the osmotic potential of a solution, the more difficult it is for seeds or plants to extract soil water they need for normal growth.

Renewed interest in placing fertilizer in or close to the seed row makes it important to remember that an increase in salt concentration in the fertilizer band can cause seed and seedling injury. Placing fertilizer at least two inches away from the seed can usually prevent injury. Excess fertilizer application in a starter band can still produce injury, especially under dry conditions.

Salt index values for several fertilizer materials are listed in Table1. A salt index is calculated by comparing the increase in osmotic potential brought about by addition of that fertilizer material compared to the increase in osmotic potential when an equivalent weight of sodium nitrate is added to water. The salt index of a mixed fertilizer containing N, P and K is the sum of the salt index values (partial salt index) of its components.

The salt index of sodium nitrate is defined as 100. Fertilizer materials with salt indices greater than 100 produce an osmotic potential greater than an equal weight of sodium nitrate. Fertilizers with salt index values less than 100 produce an osmotic potential less than an equal weight of sodium nitrate.

The salt index <u>does not predict the amount of material that will produce injury to crops</u> in a particular soil. It classifies fertilizer material relative to each other and shows which is most likely to cause injury. It is possible to formulate similar grades of mixed fertilizers from different materials that have significantly different salt indices.

Crop tolerances vary widely to increased osmotic potential from fertilizer near the seed. Wheat is moderately tolerant of high-salt conditions while soybeans are very sensitive. Corn is intermediate in tolerance. Dry soil conditions as well as fertilizers that produce free ammonia (urea, UAN, DAP) will significantly increase seed and seedling stress leading to injury or possible death. Be aware of the salt index of your starter fertilizer and don't overstress your young crop.

Sources:

Salt Index of Fertilizers, 1986, Pm-1274d, Iowa State University Fertilizer Application and Technology, 1999, Meister Publishing Western Fertilizer Handbook, 1985, The Interstate Publishers & Printers

Table 1. Salt Index of Fertilizer Materials and Soil Amendments

Nitrogen: Anhydrous ammonia, 82% N 47.1 0.572 Ammonium nitrate, 34% N 104.0 3.059 Ammonium sulfate, 21% N, 24% S 88.3 3.252 Urea, 46% N 74.4 1.618 Urea-ammonium nitrate solution: 28% N (39% ammonium nitrate, 31% urea) 63.0 2.250 32% N (44% ammonium nitrate, 35% urea) 71.1 2.221 Calcium nitrate, 15.5% N 100.0 6.080 Posphorus: Ordinary superphosphate, 20% P₂0₅ 7.8 0.390 Triple superphosphate, 45% P₂0₅ 10.1 0.224 Monoammonium phosphate: 26.7 0.405 11% N, 52% P₂0₅ 26.7 0.405 Diammonium phosphate, 18% N, 46% P₂0₅ 29.2 0.456 Ammonium polyphosphate, 19% N, 34% P₂0₅ 29.2 0.456 Ammonium polyphosphate, 19% N, 34% P₂0₅ 20.0 0.455 Phosphoric acid, 72% P₂0₅ 161.3 ** 1.613 ** Phosphoric acid, 72% P₂0₅ 161.61 ** 1.754 *** Potassium thiosife, 60% K₂0 <t< th=""><th>Material and Analysis</th><th>Salt Index</th><th>Partial Salt Index *</th></t<>	Material and Analysis	Salt Index	Partial Salt Index *
Anhydrous ammonia, 82% N 47.1 0.572 Ammonium nitrate, 34% N 104.0 3.059 Ammonium sulfate, 21% N, 24% S 88.3 3.252 Urea, 46% N 74.4 1.618 Urea-ammonium nitrate solution: 28% N (39% ammonium nitrate, 31% urea) 63.0 2.250 32% N (44% ammonium nitrate, 35% urea) 71.1 2.221 Calcium nitrate, 15.5% N 65.0 4.194 Sodium nitrate, 16.5% N 100.0 6.080 Phosphorus: Ordinary superphosphate, 20% P ₂ 0 ₅ 7.8 0.390 Triple superphosphate, 45% P ₂ 0 ₅ 10.1 0.224 Monoammonium phosphate: 11% N, 52% P ₂ 0 ₅ 26.7 0.405 10% N, 50% P ₂ 0 ₅ 24.3 0.405 Diammonium phosphate, 18% N, 46% P ₂ 0 ₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P ₂ 0 ₅ 20.0 0.455 Phosphoric acid, 54% P ₂ 0 ₅ 16.13 ** Phosphoric acid, 72% P ₂ 0 ₅ 16.13 ** Potassium: Potassium chloride, 60% K ₂ 0 10.15 Potassium hydroxide, 83.6% K ₂ 0 10.15 Potassium hydroxide, 83.6% K ₂ 0 Potassium sulfate, 50% K ₂ 0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 22% K ₂ 0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 22.2% P ₂ 0 ₅ , 34.6% K ₂ 0 8.4 0.097 Potassium hydroxide, 83.6% K ₂ 0 8.4 0.097 Potassium hydroxide, 22.2% P ₂ 0 ₅ , 34.6% K ₂ 0 8.4 0.097 Potassium hydroxide, 22.2% K ₂ 0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 22.2% P ₂ 0 ₅ , 34.6% K ₂ 0 8.4 0.097 Potassium hydroxide, 22.2% P ₂ 0 ₅ , 34.6% K ₂ 0 8.4 0.097 Potassium hydroxide, 22.2% N ₂ 0, 34.6% K ₂ 0 8.4 0.097 Potassium hydroxide, 22.2% N ₂ 0, 17% S 8.1 0.247 Magnesium oxide, 60% Mg Ammonium thiosulfate, 12% N, 26% S 99.4 7.533 Ammonium polysulfide, 20% N, 40% S 99.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium sulfate, 10% Mg, 14% S 44.0 0.68 Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg Monore salts, 20% Manure salts, 20%	Nitrogen:		
Ammonium sulfate, 21% N, 24% S Urea, 46% N 74.4 1.618 Urea-ammonium nitrate solution: 28% N (39% ammonium nitrate, 31% urea) 32% N (44% ammonium nitrate, 35% urea) 32% N (44% ammonium nitrate, 35% urea) 71.1 2.221 Calcium nitrate, 15.5% N 65.0 3.4.194 Sodium nitrate, 15.5% N 100.0 6.080 Phosphorus: Ordinary superphosphate, 20% P ₂ 0 ₅ 7.8 0.390 Triple superphosphate, 45% P ₂ 0 ₅ 10.1 0.224 Monoammonium phosphate: 11% N, 52% P ₂ 0 ₅ 26.7 0.405 10% N, 50% P ₂ 0 ₅ 22.7 0.405 10% N, 50% P ₂ 0 ₅ 24.3 0.405 Diammonium phosphate, 18% N, 46% P ₂ 0 ₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P ₂ 0 ₅ Phosphoric acid, 54% P ₂ 0 ₅ Phosphoric acid, 54% P ₂ 0 ₅ Phosphoric acid, 72% P ₂ 0 ₅ Phosphoric acid, 72% P ₂ 0 ₅ Potassium thloride, 60% K ₂ 0 Potassium hydroxide, 83.6% K ₂ 0 Potassium nitrate, 13% N, 44% K ₂ 0 Potassium nitrate, 13% N, 44% K ₂ 0 Potassium sulfate, 50% K ₂ 0, 18% S Sulfate of potash-magnesia, 22% K ₂ 0, 11% Mg, 22% S Mhonopotassium phosphate, 52.2% P ₂ 0 ₅ , 34.6% K ₂ 0 Potassium thiosulfate, 25% K ₂ 0, 17% S Ammonium polysulfide, 20% N, 40% S Gypsum, 23% Ca, 17% S Ammonium polysulfide, 20% N, 40% S Gypsum, 23% Ca, 17% S Magnesium oxide, 60% Mg Magnesium oxide, 60% Mg Magnesium oxide, 60% Mg Magnesium sulfate, 10% Mg, 14% S Miscellaneous: Calcium carbonate, lime, 35% Ca Dolomite, 21.5% Ca, 11.5% Mg Monoptas, 21.57 Handing ammonium phosp and the solution of th	_	47.1	0.572
Urea, 46% N Urea-ammonium nitrate solution: 28% N (44% ammonium nitrate, 31% urea) 63.0 2.250 32% N (44% ammonium nitrate, 35% urea) 71.1 2.221 Calcium nitrate, 15.5% N 65.0 4.194 Sodium nitrate, 16.5% N 100.0 6.080 Phosphorus: Ordinary superphosphate, 20% P₂0₅ 7.8 0.390 Triple superphosphate, 45% P₂0₅ 10.1 0.224 Monoammonium phosphate: 11% N, 52% P₂0₅ 26.7 0.405 10% N, 50% P₂0₅ 24.3 0.405 Diammonium phosphate, 18% N, 46% P₂0₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P₂0₅ 20.0 0.455 Phosphoric acid, 54% P₂0₅ 1.613 ** 1.613 ** Phosphoric acid, 54% P₂0₅ 1.62 1.936 Potassium: 1.015 1.936 Potassium chloride, 60% K₂0 116.2 1.936 Potassium nitrate, 13% N, 44% K₂0 69.5 1.219 Potassium phydroxide, 83.6% K₂0 42.6 0.852 Sulfate of potash-magnesia, 22% K₂0, 17% S 42.6 <t< td=""><td>Ammonium nitrate, 34% N</td><td>104.0</td><td>3.059</td></t<>	Ammonium nitrate, 34% N	104.0	3.059
Urea-ammonium nitrate solution: 28% N (39% ammonium nitrate, 31% urea) 63.0 2.250 32% N (44% ammonium nitrate, 35% urea) 71.1 2.221 Calcium nitrate, 15.5% N 65.0 4.194 Sodium nitrate, 16.5% N 100.0 6.080 Phosphorus: Ordinary superphosphate, 20% P₂0₅ 7.8 0.390 Triple superphosphate, 45% P₂0₅ 10.1 0.224 Monoammonium phosphate, 45% P₂0₅ 26.7 0.405 11% N, 52% P₂0₅ 26.7 0.405 10% N, 50% P₂0₅ 24.3 0.405 Diammonium phosphate, 18% N, 46% P₂0₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P₂0₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P₂0₅ 20.0 0.455 Phosphoric acid, 54% P₂0₅ 20.0 0.455 Phosphoric acid, 54% P₂0₅ 10.15 1.613 ** Potassium: Potassium hydroxide, 83.6% K₂0 116.2 1.936 Potassium hydroxide, 83.6% K₂0 42.6 0.852 S	Ammonium sulfate, 21% N, 24% S	88.3	3.252
28% N (39% ammonium nitrate, 31% urea) 63.0 2.250 32% N (44% ammonium nitrate, 35% urea) 71.1 2.221 Calcium nitrate, 15.5% N 65.0 4.194 Sodium nitrate, 16.5% N 100.0 6.080 Phosphorus: Ordinary superphosphate, 20% P ₂ 0 ₅ 7.8 0.390 Triple superphosphate, 45% P ₂ 0 ₅ 7.8 0.390 Triple superphosphate, 45% P ₂ 0 ₅ 7.8 0.390 Triple superphosphate, 45% P ₂ 0 ₅ 7.8 0.390 Triple superphosphate, 45% P ₂ 0 ₅ 26.7 0.405 11% N, 52% P ₂ 0 ₅ 26.7 0.405 10% N, 50% P ₂ 0 ₅ 24.3 0.405 Diammonium phosphate, 18% N, 46% P ₂ 0 ₅ 29.2 0.456 Ammonium polyphosphate, 18% N, 46% P ₂ 0 ₅ 29.2 0.456 Ammonium polyphosphate, 18% N, 46% P ₂ 0 ₅ 29.2 0.456 Phosphoric acid, 54% P ₂ 0 ₅ 29.0 0.455 Phosphoric acid, 54% P ₂ 0 ₅ 10.15 1.613 *** Potassium chloride, 60% K ₂ 0 116.2	Urea, 46% N	74.4	1.618
32% N (44% ammonium nitrate, 35% urea) Calcium nitrate, 15.5% N Sodium nitrate, 15.5% N Sodium nitrate, 16.5% N 100.0 Phosphorus: Ordinary superphosphate, 20% P₂0₅ Triple superphosphate, 45% P₂0₅ 10.1 0.224 Monoammonium phosphate: 11% N, 52% P₂0₅ 10% N, 50% P₂0₅ 26.7 10% N, 50% P₂0₅ 26.7 26.7 26.7 26.7 26.7 26.7 26.7 26.7	Urea-ammonium nitrate solution:		
Calcium nitrate, 15.5% N 65.0 4.194 Sodium nitrate, 16.5% N 100.0 6.080 Phosphorus: Ordinary superphosphate, 20% P₂0₅ 7.8 0.390 Triple superphosphate, 45% P₂0₅ 10.1 0.224 Monoammonium phosphate. 11% N, 52% P₂0₅ 26.7 0.405 10% N, 50% P₂0₅ 24.3 0.405 Diammonium phosphate, 18% N, 46% P₂0₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P₂0₅ 29.2 0.455 Phosphoric acid, 54% P₂0₅ 20.0 0.455 Phosphoric acid, 54% P₂0₅ 20.0 0.455 Phosphoric acid, 72% P₂0₅ 1.613 ** ** Phosphoric acid, 72% P₂0₅ 116.2 1.936 Potassium chloride, 60% K₂0 116.2 1.936 Potassium phoric acid, 72% P₂0₅ 1.015 ** Potassium phoric acid, 72% P₂0₅ 42.6 0.852 Sulfate of potash-magnesia, 22% K₂0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P₂0₅, 34.6% K₂0 8.4 0.097 Potassium thiosulfate, 25% K₂0, 17% S 8.4	28% N (39% ammonium nitrate, 31% urea)	63.0	2.250
Sodium nitrate, 16.5% N 100.0 6.080 Phosphorus: Ordinary superphosphate, 20% P₂0₅ 7.8 0.390 Triple superphosphate, 45% P₂0₅ 10.1 0.224 Monoammonium phosphate: 26.7 0.405 11% N, 52% P₂0₅ 24.3 0.405 10% N, 50% P₂0₅ 24.3 0.405 Diammonium phosphate, 18% N, 46% P₂0₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P₂0₅ 20.0 0.455 Phosphoric acid, 54% P₂0₅ 20.0 0.455 Phosphoric acid, 72% P₂0₅ 1.613 ** 1.754 ** Potassium: ** 1.754 ** Potassium chloride, 60% K₂0 116.2 1.936 Potassium hidrate, 13% N, 44% K₂0 69.5 1.219 Potassium sulfate, 50% K₂0, 18% S 42.6 0.852 Sulfate of potash-magnesia, 22% K₂0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P₂0₅, 34.6% K₂0 8.4 0.097 Potassium thiosulfate, 12% N, 26% S 90.4 7.533 Ammonium thiosulfate, 12% N, 26% S	32% N (44% ammonium nitrate, 35% urea)	71.1	2.221
Phosphorus: Ordinary superphosphate, 20% P₂0₅ 7.8 0.390 Triple superphosphate, 45% P₂0₅ 10.1 0.224 Monoammonium phosphate:	Calcium nitrate, 15.5% N	65.0	4.194
Ordinary superphosphate, 20% P205 7.8 0.390 Triple superphosphate, 45% P205 10.1 0.224 Monoammonium phosphate:	Sodium nitrate, 16.5% N	100.0	6.080
Ordinary superphosphate, 20% P205 7.8 0.390 Triple superphosphate, 45% P205 10.1 0.224 Monoammonium phosphate:	Phosphorus:		
Triple superphosphate, 45% P₂0₅ 10.1 0.224 Monoammonium phosphate: 11% N, 52% P₂0₅ 26.7 0.405 10% N, 50% P₂0₅ 24.3 0.405 Diammonium phosphate, 18% N, 46% P₂0₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P₂0₅ 20.0 0.455 Phosphoric acid, 54% P₂0₅ 20.0 0.455 Phosphoric acid, 72% P₂0₅ 1.613 *** Phosphoric acid, 72% P₂0₅ 1.62 1.754 *** Potassium: Potassium chloride, 60% K₂0 116.2 1.936 Potassium hydroxide, 83.6% K₂0 69.5 1.219 Potassium nitrate, 13% N, 44% K₂0 69.5 1.219 Potassium sulfate, 50% K₂0, 18% S 42.6 0.852 Sulfate of potash-magnesia, 22% K₂0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P₂0₅, 34.6% K₂0 8.4 0.097 Potassium thiosulfate, 25% K₂0, 17% S 68.0 2.720 Sulfur: Ammonium thiosulfate, 12% N, 26% S 90.4 7.533 Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S <t< td=""><td>•</td><td>7.8</td><td>0.390</td></t<>	•	7.8	0.390
11% N, 52% P ₂ O ₅ 26.7 0.405 10% N, 50% P ₂ O ₅ 24.3 0.405 Diammonium phosphate, 18% N, 46% P ₂ O ₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P ₂ O ₅ 20.0 0.455 Phosphoric acid, 54% P ₂ O ₅ 20.0 0.455 Phosphoric acid, 72% P ₂ O ₅ 1.613 ** Potassium: ** 1.754 ** Potassium chloride, 60% K ₂ O 116.2 1.936 Potassium hydroxide, 83.6% K ₂ O 69.5 1.015 Potassium nitrate, 13% N, 44% K ₂ O 69.5 1.219 Potassium sulfate, 50% K ₂ O, 18% S 42.6 0.852 Sulfate of potash-magnesia, 22% K ₂ O, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P ₂ O ₅ , 34.6% K ₂ O 8.4 0.097 Potassium thiosulfate, 25% K ₂ O, 17% S 68.0 2.720 Sulfur: Ammonium thiosulfate, 25% K ₂ O, 17% S 90.4 7.533 Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002		10.1	0.224
10% N, 50% P₂0₅ 24.3 0.405 Diammonium phosphate, 18% N, 46% P₂0₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P₂0₅ 20.0 0.455 Phosphoric acid, 54% P₂0₅ 1.613 ** 1.613 ** Phosphoric acid, 72% P₂0₅ 1.613 ** 1.754 ** Potassium: Potassium chloride, 60% K₂0 116.2 1.936 Potassium hydroxide, 83.6% K₂0 10.15 1.015 Potassium nitrate, 13% N, 44% K₂0 69.5 1.219 Potassium sulfate, 50% K₂0, 18% S 42.6 0.852 Sulfate of potash-magnesia, 22% K₂0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P₂0₅, 34.6% K₂0 8.4 0.097 Potassium thiosulfate, 25% K₂0, 17% S 68.0 2.720 Sulfur: Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002 Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 <t< td=""><td>Monoammonium phosphate:</td><td></td><td></td></t<>	Monoammonium phosphate:		
Diammonium phosphate, 18% N, 46% P₂0₅ 29.2 0.456 Ammonium polyphosphate, 10% N, 34% P₂0₅ 20.0 0.455 Phosphoric acid, 54% P₂0₅ 1.613 ** 1.754 ** Phosphoric acid, 72% P₂0₅ 1.613 ** 1.754 ** Potassium: Potassium chloride, 60% K₂0 116.2 1.936 Potassium hydroxide, 83.6% K₂0 69.5 1.219 Potassium nitrate, 13% N, 44% K₂0 69.5 1.219 Potassium sulfate, 50% K₂0, 18% S 42.6 0.852 Sulfate of potash-magnesia, 22% K₂0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P₂0₅, 34.6% K₂0 8.4 0.097 Potassium thiosulfate, 25% K₂0, 17% S 68.0 2.720 Sulfur: Ammonium thiosulfate, 25% K₂0, 17% S 90.4 7.533 Ammonium thiosulfate, 12% N, 26% S 90.4 7.533 Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002 <tr< td=""><td>11% N, 52% P₂O₅</td><td>26.7</td><td>0.405</td></tr<>	11% N, 52% P ₂ O ₅	26.7	0.405
Ammonium polyphosphate, 10% N, 34% P $_2O_5$ 20.0 0.455 Phosphoric acid, 54% P $_2O_5$ 1.613 ** Phosphoric acid, 72% P $_2O_5$ 1.754 ** Potassium: Potassium chloride, 60% K $_2O$ 116.2 1.936 Potassium hydroxide, 83.6% K $_2O$ 1.015 1.015 Potassium nitrate, 13% N, 44% K $_2O$ 69.5 1.219 Potassium sulfate, 50% K $_2O$, 18% S 42.6 0.852 Sulfate of potash-magnesia, 22% K $_2O$, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P $_2O_5$, 34.6% K $_2O$ 8.4 0.097 Potassium thiosulfate, 25% K $_2O$, 17% S 68.0 2.720 Sulfur: Ammonium thiosulfate, 12% N, 26% S 90.4 7.533 Ammonium thiosulfate, 12% N, 26% S 90.4 7.533 Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002 Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: 2.5% Ca, 2.11	10% N, 50% P ₂ O ₅	24.3	0.405
Phosphoric acid, 54% P₂0₅ 1.613 ** Phosphoric acid, 72% P₂0₅ 1.754 ** Potassium: Potassium chloride, 60% K₂0 116.2 1.936 Potassium hydroxide, 83.6% K₂0 1.015 1.015 Potassium nitrate, 13% N, 44% K₂0 69.5 1.219 Potassium sulfate, 50% K₂0, 18% S 42.6 0.852 Sulfate of potash-magnesia, 22% K₂0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P₂0₅, 34.6% K₂0 8.4 0.097 Potassium thiosulfate, 25% K₂0, 17% S 68.0 2.720 Sulfur: Ammonium thiosulfate, 12% N, 26% S 90.4 7.533 Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002 Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636	Diammonium phosphate, 18% N, 46% P ₂ O ₅	29.2	0.456
Phosphoric acid, 72% P₂0₅ Potassium: Potassium chloride, 60% K₂0 116.2 1.936 Potassium hydroxide, 83.6% K₂0 1.015 Potassium nitrate, 13% N, 44% K₂0 69.5 1.219 Potassium sulfate, 50% K₂0, 18% S 42.6 0.852 Sulfate of potash-magnesia, 22% K₂0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P₂0₅, 34.6% K₂0 8.4 0.097 Potassium thiosulfate, 25% K₂0, 17% S 68.0 2.720 Sulfur: Ammonium thiosulfate, 12% N, 26% S 90.4 7.533 Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002 Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636 <td>Ammonium polyphosphate, 10% N, 34% P₂0₅</td> <td>20.0</td> <td>0.455</td>	Ammonium polyphosphate, 10% N, 34% P ₂ 0 ₅	20.0	0.455
Potassium: Potassium chloride, 60% K₂0 116.2 1.936 Potassium hydroxide, 83.6% K₂0 1.015 Potassium nitrate, 13% N, 44% K₂0 69.5 1.219 Potassium sulfate, 50% K₂0, 18% S 42.6 0.852 Sulfate of potash-magnesia, 22% K₂0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P₂0₅, 34.6% K₂0 8.4 0.097 Potassium thiosulfate, 25% K₂0, 17% S 68.0 2.720 Sulfur: Ammonium thiosulfate, 12% N, 26% S 90.4 7.533 Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002 Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636	Phosphoric acid, 54% P ₂ 0 ₅		1.613 **
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Phosphoric acid, 72% P ₂ 0 ₅		1.754 **
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Potassium:		
Potassium hydroxide, 83.6% K₂0 1.015 Potassium nitrate, 13% N, 44% K₂0 69.5 1.219 Potassium sulfate, 50% K₂0, 18% S 42.6 0.852 Sulfate of potash-magnesia, 22% K₂0, 11% Mg, 22% S 43.4 1.971 Monopotassium phosphate, 52.2% P₂0₅, 34.6% K₂0 8.4 0.097 Potassium thiosulfate, 25% K₂0, 17% S 68.0 2.720 Sulfur: Ammonium thiosulfate, 12% N, 26% S 90.4 7.533 Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002 Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636		116.2	1.936
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Sulfate of potash-magnesia, 22% K_2O , 11% Mg, 22% S43.41.971Monopotassium phosphate, 52.2% P_2O_5 , 34.6% K_2O 8.40.097Potassium thiosulfate, 25% K_2O , 17% S68.02.720Sulfur:Ammonium thiosulfate, 12% N, 26% S90.47.533Ammonium polysulfide, 20% N, 40% S59.22.960Gypsum, 23% Ca, 17% S8.10.247Magnesium oxide, 60% Mg1.70.002Magnesium sulfate, 10% Mg, 14% S44.02.687Miscellaneous:4.70.083Calcium carbonate, lime, 35% Ca4.70.083Dolomite, 21.5% Ca, 11.5% Mg0.80.042Manure salts, 20%112.74.636		69.5	1.219
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		42.6	0.852
Potassium thiosulfate, 25% K_2O , 17% S 68.0 2.720 Sulfur: Ammonium thiosulfate, 12% N, 26% S 90.4 7.533 Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002 Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636		43.4	1.971
Sulfur:Ammonium thiosulfate, 12% N, 26% S90.47.533Ammonium polysulfide, 20% N, 40% S59.22.960Gypsum, 23% Ca, 17% S8.10.247Magnesium oxide, 60% Mg1.70.002Magnesium sulfate, 10% Mg, 14% S44.02.687Miscellaneous:Calcium carbonate, lime, 35% Ca4.70.083Dolomite, 21.5% Ca, 11.5% Mg0.80.042Manure salts, 20%112.74.636	· · · · · · · · · · · · · · · · · · ·	8.4	0.097
Ammonium thiosulfate, 12% N, 26% S90.47.533Ammonium polysulfide, 20% N, 40% S59.22.960Gypsum, 23% Ca, 17% S8.10.247Magnesium oxide, 60% Mg1.70.002Magnesium sulfate, 10% Mg, 14% S44.02.687Miscellaneous:Calcium carbonate, lime, 35% Ca4.70.083Dolomite, 21.5% Ca, 11.5% Mg0.80.042Manure salts, 20%112.74.636	Potassium thiosulfate, 25% K ₂ 0, 17% S	68.0	2.720
Ammonium polysulfide, 20% N, 40% S 59.2 2.960 Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002 Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636			
Gypsum, 23% Ca, 17% S 8.1 0.247 Magnesium oxide, 60% Mg 1.7 0.002 Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636	Ammonium thiosulfate, 12% N, 26% S	90.4	7.533
Magnesium oxide, 60% Mg 1.7 0.002 Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636	Ammonium polysulfide, 20% N, 40% S	59.2	2.960
Magnesium sulfate, 10% Mg, 14% S 44.0 2.687 Miscellaneous: 35% Ca 4.7 0.083 Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636	Gypsum, 23% Ca, 17% S	8.1	0.247
Miscellaneous: Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636	Magnesium oxide, 60% Mg	1.7	0.002
Calcium carbonate, lime, 35% Ca 4.7 0.083 Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636	Magnesium sulfate, 10% Mg, 14% S	44.0	2.687
Dolomite, 21.5% Ca, 11.5% Mg 0.8 0.042 Manure salts, 20% 112.7 4.636	Miscellaneous:		
Manure salts, 20% 112.7 4.636	Calcium carbonate, lime, 35% Ca	4.7	0.083
	Dolomite, 21.5% Ca, 11.5% Mg	0.8	0.042
Manure salts, 30% 91.9 3.067	Manure salts, 20%	112.7	4.636
	Manure salts, 30%	91.9	3.067

^{*} The salt index of a mixed fertilizer containing N, P and K is the sum of the <u>partial salt index</u> per unit (20 lbs) of plant nutrient times the number of units due to each component in the formulation.

^{**} Per 100 lbs of H₃PO₄