

Usage Guide for LC-12

Soil Applications

Crop	Soil rates per acre per treatment*	Suggestions and Methods
Corn and Sorghum	1 to 2 gallons	Apply soil treatment before emergence and again as late as machinery passage allows
Rice – Dryland	1 to 2 gallons	Apply soil treatment before emergence and again between joining and early heading
Rice – Lowland	1 to 2 gallons	Apply first treatment 7 days before flooding and make foliar treatment at the boot stage
Winter Grains	1 to 2 gallons	Apply soil treatment before emergence and again at spring green-up
Spring Grains	1 to 2 gallons	Apply soil treatment before emergence and again at the onset of flowering
Beans, field beans, soybeans, peas, and peanuts	1 to 2 gallons	Apply soil treatment before emergence and again at the onset of flowering
Cotton	1 to 2 gallons	Apply soil treatment before emergence and again at the onset of flowering
Hay and Forages	1 to 2 gallons	Apply soil treatment in spring at the beginning of growth and again after each cutting
Pastures	1 to 2 gallons	Apply soil treatment in the spring at the beginning of growth, again at midseason and a 3 rd treatment before dormancy
Tropical Grasses	1 to 2 gallons	Apply soil treatment every 3 months
Potatoes	1 to 2 gallons	Apply soil treatment before emergence and again at the hook stage
Sugar Cane	1 to 2 gallons	Apply soil treatment before emergence and again at 3 months and 6 months after planting
Root Crops (beets, radishes, carrots, etc)	1 to 2 gallons	Apply soil treatment at or within 15 days of planting
Vegetables (tomatoes, okra, eggplant, cucumbers, cauliflower, broccoli, peppers, etc).	1 to 2 gallons	Apply soil treatment at planting or before emergence and then every 6 weeks during active production
Leaf Crops (lettuce, parsley, dill, herbs)	1 to 1 2/3 gallons	Apply before emergence and again 6 weeks after emergence
Citrus	2 gallons	Apply soil treatment every 2 months during the active/productive season
Fruits (apples, peaches, pears, apricots, plums, cherries, walnuts, pecans, etc.)	2 gallons	Apply soil treatment 1-2 weeks prior to leaf emergence and again at the beginning of fruiting
Topical Fruits (mangos, papayas, guavas, bananas, pineapples, pistachios, brazil nuts, etc)	2 gallons	Apply soil treatment every 2 months during the active/productive season
Vineyards (Grapes)	1 to 2 gallons	Apply soil treatment at leaf emergence and again when fruit is half mature
Berries (strawberries, raspberries, blackberries, blueberries, etc.)	1 to 2 gallons	Apply soil treatment at the beginning of growth and again when fruit is half mature
Melons (watermelons, cantaloupes, etc.)	1 to 2 gallons	Apply soil treatment at planting or before emergence, and again at the onset of flowering
Landscape Ornamentals	6 oz per 1000 square feet of beds	Apply soil treatment in spring at green-up or at transplanting and again prior to dormancy. Year-round climates should make soil applications every 3 months.
Flowers	1 ounce per 10 gallons of irrigation water	Apply weekly in irrigation water
Greenhouse plants	1 ounce per 10 gallons of irrigation water	Apply weekly in irrigation water
Potting Mixes	16 ounces per cubic yard of mix	When moistening the dry potting mix, add enough LC-12 into the water/fertilizer/fungicide solution to deliver 16 ounces of LC-12 per cubic yard of potting mix.
Hydroseeding	2 to 5 gallons	Once the water is added to the hydroseeding tank, add enough LC-12 to deliver 2 gallons of LC-12 per acre. In very harsh environments, add up to 5 gallons of LC-12 per acre in the hydroseeding solution.
Turf and Golf Course	1 to 2 gallons	Apply soil treatment at spring green up and with (or at the time of) each normal fertilizer application. Tees and greens may be treated more frequently with half-rate applications.

* Soil applications can be made in numerous ways. LC-12 can be sprayed onto the soil or dripped into the crop row, or it can be run through overhead, trickle, or underground irrigation systems.

Irrigation Applications

When making soil treatments through irrigation equipment it is important to keep the final concentration of LC-12 to water being emitted to the soil within the parameters listed below. It may be necessary to adjust the irrigation system to deliver more or less water per acre per cycle to deliver the desired amount of LC-12 listed for the crop you are treating.

Maximum Concentration	Optimal Concentration	Minimum Concentration
1 ounce LC-12 per 1 gallon of water	1 ounce LC-12 per 10 gallons of water	1 ounce LC-12 per 20 gallons of water

Foliar Applications

All crops will benefit from foliar applications of humic acids when it fits into the crop management practice. Foliar applications should be made *in addition* to the soil treatments. Foliar applications should be made at the rate of 16 to 32 ounces of LC-12 per acre per treatment. Foliar treatments with LC-12 are strongly recommended during four growth stages of the crop: immediately before the appearance of buds, before blossoming, after the flowers have fallen, and during ripening. When soil treatments are not possible, foliar treatments may be made every 14 days using 16 ounces of LC-12 per acre. It is important to always use LC-12 within the concentration parameters listed below.

Maximum Concentration	Optimal Concentration	Minimum Concentration
1 ounce LC-12 per 1 gallon of water	1 ounce LC-12 per 10 gallons of water	1 ounce LC-12 per 20 gallons of water

Additional Usage Notes

- When applied together with fertilizers or pesticides, the use of humate increases the efficacy of the companion materials. In most cases, systemic pesticide rates can be reduced by 25% or more when the humate is added to the application. The total annual need for nitrogen can be reduced by 30% or more when the full program of soil treatments using humate are applied to the crop. In all cases, we suggest using personal experience and experimentation to determine the rates of companion products that will provide acceptable performance.
- Humates have proven compatible with virtually all companion products except those with a very low pH. In laboratory experiments, no problems have been found other than when companion materials have a pH less than 3.0. However, if there is any doubt about compatibility, a jar test is strongly recommended. To be safe, a jar test is recommended with any material that has a pH less than 4.0.