

IMPORTANT INFORMATION REGARDING YOUR NEW 4-WAY ANALYZER

HOW TO USE YOUR ANALYZER TO MEASURE FERTILITY

1. Remove the top 2" of the soil. Break up and crumble the soil underneath to a total depth of 5".
2. Thoroughly wet the soil with water (ideally rain or distilled water) to a mud consistency.
3. Wipe the meter probes clean with a tissue or paper towel.
4. Move the switch to the first (top) position.
5. Insert the probes into the soil to within 1" of the casing. Allow approximately 10 seconds for the reading to stabilize.
6. Record the reading. Remove the probes from the soil and clean thoroughly.

The standards by which the instrument is calibrated are as follows:

	Too Little	Ideal Range	Too Much
Nitrogen	50 ppm	50 to 200 ppm	200 ppm
Phosphorous	4 ppm	4 to 14 ppm	14 ppm
Potash	50 ppm	50 to 200 ppm	200 ppm

ppm is defined as parts-per-million

HOW TO USE YOUR METER TO MEASURE LIGHT

1. Move the switch to the 2nd position.
2. Point the photocell on the top of the analyzer directly at the light source while holding the analyzer at leaf level. Avoid positioning your hand or body between the light source and the plant or position you are measuring.
3. Record the reading (x 1000) and the time of day.
4. Take readings in the mid-morning, mid afternoon and early evening to determine the average light intensity.

Example:

9 AM reading X 4 hours = Foot-candle hours (Average between 7AM and 11AM)

1 PM reading X 4 hours = Foot-candle hours (Average between 11AM and 3PM)

5 PM reading X 4 hours = Foot candle hours (Average between 3PM and 7PM)

Total Daily Foot Candle Hours = Total From Above

Information on plant light requirements is in the enclosed pamphlet.

HOW TO USE YOUR METER TO MEASURE SOIL MOISTURE

1. Move the switch to the 3rd position.
2. Insert probes into soil up to plastic base, about half way between the edge of the container & the stem of the plant. Do not push the probe too near the stem.
3. Note the reading.
4. Remove the probes from the soil. Wipe thoroughly with a soft cloth or tissue before taking another reading or putting away.
5. Do not leave the probe in soil for long periods of time. Do not use in liquids!

Information on plant moisture requirements is on the panel below.

HOW TO USE YOUR METER TO MEASURE SOIL pH

1. Remove the top 2" of the surface soil. Break up and crumble the soil underneath to a total depth of 5". Remove any stones or organic debris such as leaves and twigs because they can affect the final result.
2. Thoroughly wet the soil with water (ideally rain or distilled water) to a mud consistency.
3. Move the switch to the last (bottom) position.
4. Wet probes. Polish probe on the FAR RIGHT ONLY, with the enclosed special cleaning pad.
5. Insert probes into soil up to plastic base.
6. Wait one minute and take reading.
7. Wipe the probes clean and dry.

Information on soil pH and plant pH preferences is on the enclosed pamphlet.

SPECIAL CLEANING PAD

The cleaning pad supplied with this analyzer has been specially selected for its compatibility with the analyzer probe metals. Other type of cleaners may cut or otherwise damage probe surfaces and/or adversely affect analyzer readings. Additional pads are available at a cost of \$2.00 for 3 pads, plus \$1.00 for postage and handling. Please send a check or money order, payable to Luster Leaf Products, Inc. to the address on the back of this card. No COD or phone orders, please.

GENERAL WATERING ADVICE

Each plant in the Watering Chart has been given a “watering number”. For each plant, water only when the needle registers on or below the watering number. Plants with higher watering numbers (3 or 4) like to be kept moist. Plants with lower numbers prefer drier conditions. Check small pots more often than larger ones, they dry out more quickly. Over-watering rots plant roots so don't water too frequently.

GENERAL WATERING GUIDE FOR CONTAINERIZED GROWING

Shrubs - foliage: 1 - 2

Annuals: 1 - 2

Perennials: 2 - 3

Shrubs - flowering: 2 - 3

Biennials: 1 - 2

Vegetables: 2 - 3

WATERING CHART

WATERING NO. 1			
Aloe	Gold-Dust Plant	Peperomia	Calceolaria
Hens and Chicks	Poinsettia	Cape Ivy	Inch Plant
Pony Tail	Cardinal Flower	Jade Plant	Shrimp Plant
Century Plant	Jelly Bean Plant	Snake Plant	Ceropegia
Kalanchoe	Sugar Almond	Dipladenia	Kaffir Lily
Umbrella Tree	Dumb Cane	Lantana	Verbena
Euonymus	Lucky Clover	Vriesia	Figs
Myrtle	Wandering Jew	Flaming Katy	Orchid
Geranium	Panda Plant		
WATERING NO. 2			
African Violet	Castor Oil Plant	Monstera	Amarylis
Chinese Evergreen	Nicodemia	Aralia	Cineraria
Norfolk Island Pine	Arrowhead Vine	Crown of Thorns	Parasol Plant
Bamboo Palm	Devil's Ivy	Philodendron	Bird of Paradise
Easter Lily	Rubber Plant	Black-Eyed Susan	Fat-headed Lizzie
Silk Oak	Browalia	Figs, Weeping	Snakeskin Plant
Burro's tail	Glory Lily	Swedish Ivy	Buxus
Grape Ivy	Wax Plant	Cacti	Succulents
Hibiscus	Cast Iron Plant	Jerusalem Cherry	
WATERING NO. 3			
Baby's Tears	Columnea	Kangaroo Thorn	Bay Tree
Copperleaf	Mosaic Plant	Begonia Rex	Coral Berry
Nasturtium	Begonia	Creeping Moss	Oleander
Bloodleaf	Cupid's Bower	Parlor Palm	Bottlebrush Plant
Cyclamen	Passion Flower	Buddhist Pine	Dracena
Pilea	Busy Lizzie	Figs, Creeping	Plume Flower
Caladium	Finger Aralia	Prayer Plant	Calla Lily
Flowering Maple	Primula	Camelia	Friendship Plant
Sensitive Plant	Chenille Plant	Fushia Plant	Spider Plant
Christmas Cactus	Gloxinia	Vase Plant	Christmas Pepper
Hedera Ivy	Velvet Plant	Chrysanthemum	Heliotrope
Violet Flame	Clerodendrum	Jacaranda	Zebra Plant
Coleus	Jacobinia	Peppers	
WATERING NO. 4			
Anthurium	Hyacinth	Pigmy Date Palm	Azalea
Hydrangea	Umbrella Plant	Bougainvillea	Jasmine
Venus Flytrap	Butterfly Flower	Lady Palm	Tomatoes
Ferns	Painters Palette	Melons	Gardenia
Peace Lily			

LIMITED WARRANTY

The tester is warranted free from defects for one year from date of purchase. During this period the unit may be returned to Luster Leaf Products, Inc. with proof of purchase and \$5.00 to cover postage and handling. It will be repaired or replaced. During the initial 90 days of this warranty period the selling dealer is also authorized to replace a defective meter.

This warranty does not cover abuse, accidental damage, repair by anyone other than Luster Leaf Products, Inc., or consequential loss or inconvenience resulting from use of the meter.

This warranty gives you certain specific legal rights and you may also have other rights which vary from state to state.

SERVICE

If adjustment or repair becomes necessary after the warranty expires, return the meter to Luster Leaf Products, Inc. with \$10.00 to cover postage, handling and service. Service includes labor & parts as required, except for replacement of externally damaged or lost components.

For service, or information regarding other Luster Leaf Products, Inc. items, please address:

Luster Leaf Products, Inc.
2220 Techcourt
Woodstock, Illinois 60098



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rapitest® **4-Way Analyzer**

FERTILITY

A fertile soil is one which produces satisfactory yields of crops and, because of the incorporation of plant and animal residues, contains an abundance of organic matter or humus. It has good texture, not too loose and light nor too heavy and stiff, is well drained and has a proper pH for best plant growth. A fertile soil has sufficient amounts of the three major elements, nitrogen, phosphorous and potassium (potash). It also contains a sufficient supply of the micronutrients such as boron, copper, iron, sulfur, magnesium and molybdenum and consists of an abundance of organic matter and humus.

IF THE ANALYZER READS "TOO LITTLE"

1. Liquid feed with a brand of soluble fertilizer that is recommended for the plants you intend to grow.
2. Liquid feed within 3 weeks after planting or potting and do this every month whenever you water your plants.

IF THE ANALYZER READS "IDEAL"

1. Water once a month with a soluble fertilizer that is recommended for the plants you are growing.

IF THE ANALYZER READS "TOO MUCH"

1. Water thoroughly to leach out the excess fertilizer from the soil.
2. For potted plants, repot with new soil.
3. For greenhouse plants water thoroughly to leach excess fertilizer from the soil.
4. Do not add any fertilizer. You can add manure, compost, clippings, plant wastes, residues, leaves and any other organic matter to the soil.

HOW TO INCREASE SOIL FERTILITY

There are many ways to increase and maintain the valuable nutrients of your soil which contribute to its fertility. Just as some plants need a rather acid soil, while others need a slightly alkaline soil, they also need varying amounts of nitrogen, phosphorous and potash known as NPK. Each plant brings about changes in the soil and has soil needs different from other plants. You won't need to worry much about having exactly the right amount of each element for each plant you grow. As long as your soil is well balanced and rich in organic matter your plants will not suffer.

FERTILIZER

Fertilizer is a substance added to the soil to improve fertility. Since a variety of elements contribute to the fertility of the soil, many individual elements and combinations of elements are considered fertilizers.

THE VALUE OF NITROGEN

Nitrogen is synonymous with plant nutrition. It is directly responsible for producing leaf growth and green leaves.

A deficiency causes yellow leaves and stunted growth. Too much nitrogen causes overabundant foliage with delayed flowering; the plant becomes subject to disease and its fruit is of poor quality.

Soil deficient in nitrogen can be corrected by adding compost, manure or other nitrogen-rich fertilizers such as dried blood, tankage, cottonseed meal and peanut shells. Grass clippings, weeds and garden wastes returned to the soil will increase its humus and nitrogen content.

THE VALUE OF PHOSPHOROUS

Growing plants need phosphorous. It is the major constituent of plant genetics and seed development. A deficiency causes stunted growth and seed sterility. Phosphorous aids plant maturity, increases the seed yield, increases fruit development, increases vitamin content and aids the plant's resistance to disease and winterkill.

The best source of phosphorous is phosphate rock, when it is finely ground. Bacteria that thrive in pH 6.5 to pH 7 help breakdown the phosphorous making it available to plants.

Other sources of phosphate are bone meal, cottonseed meal and activated sludge. Barring any great deficiencies, a pound of phosphate rock for every ten square feet of your garden space is a goodly amount to apply once every two or three years. Phosphorous has the tendency to "grab" hold of the soil. In this manner, phosphorous is not easily leached from the soil as is nitrogen and potash.

THE VALUE OF POTASSIUM (POTASH)

Potash strengthens the plant. It helps form carbohydrates and promotes protein synthesis. It further aids early growth, stem strength and cold hardiness.

Plants deficient in potash are usually stunted and have poorly developed root systems. Leaves are spotted, curled and appear dried out at the edges. Yields for potash deficiency are low.

Sources for potash are plant residues, manures, composts and natural sources like granite dust, basalt rock or greensand, wood ashes, leaves and seaweed.

ACIDITY AND ALKALINITY

Acidity and alkalinity of soils are the result of 1: the chemical composition of the rock from which the soil is derived, and 2: the partial or complete decomposition of vegetation. The acidity or alkalinity of the soil is measured in terms of pH. pH of the soil is the basic indicator of soil health and fertility. Soil pH is easy to determine and, in most cases, easy to control.

In years past, a gardener or farmer tasted his soil. If it tasted sour, he knew that it wasn't good for raising crops. The same thing went for a bitter taste. If it tasted sweet, he knew that he could expect high yields. He may not have known that soil that tasted sour was too acid to raise good crops and soil that tasted bitter was too alkaline to produce the yield wanted, but he knew that "sweet" soil was perfect for growing plants.

A few plants, like blueberries, flourish in fairly acid soil, but most garden crops, lawn grasses, trees, and shrubs prefer soils that are either neutral or slightly acid. Moreover, microorganisms and chemical elements in the soil work more vigorously to make nutrients available to plants when the soil is nearly neutral rather than too acid or alkaline. Nitrogen fixing bacteria are most prolific at pH 6.6 to neutral (pH7.)

Excessive acidity in the soil causes calcium, phosphorous and magnesium to be changed into forms that plants cannot use, causing them to suffer a deficiency of these elements. Plants won't tolerate highly acid conditions. Slowdown of beneficial bacterial action is part of the reason; increased toxicity from certain trace elements like aluminum is another. Deficiency of calcium and magnesium is a third possibility. The best explanation is that in acid soils, chemical reaction can lock up major nutrients, especially phosphorous, making them unavailable to plants.

Heavy use of inorganic, high-analysis fertilizers causes soil to become more acid, as does heavy use of sulfur-containing fungicides. The same result can stem from using organic fertilizers that have an acidifying effect.

Acidity and alkalinity are measured in pH units, the pH being a symbol for the relative amount of hydrogen in a substance. On a pH scale from 1 to 14, 5 and below are extremely acid and 10 or more extremely alkaline. Soil alkalinity or acidity, then, is determined by the reaction of various minerals and organic compounds with moisture in the soil.

Plants are often listed according to their pH preference. Some plants respond differently to pH in different soils. Other plants tolerate a comparatively wide range of pH.

Obviously, for high yields, the gardener or farmer must know the soil's pH. Then the gardener/farmer can either grow the kinds of plants that do best in soil of that particular pH, or steps can be taken to change the soil pH to within the preferred range for the plants desired.

For the majority of common plants, a pH of 6.5 to 7 is optimum. Soils in this pH range offer the most favorable environment for microorganisms that convert atmospheric nitrogen into a form available to plants. It also offers the best environment for the bacteria that decompose plant tissue and form humus. In this pH range, all of the essential mineral nutrients are available to plants in sufficient quantities, and generally in a much greater amount than at any other pH. Also, soil having a pH within this range is more workable, because a good crumb structure is more easily maintained.

Too acid a soil means the bacteria which decompose organic matter cannot live. Manganese & aluminum are so soluble in very acid soil that they become present in amounts toxic to plants.

Strong acidity also decreases nutrient availability, and plants may literally starve to death for one essential mineral nutrient while having so much of another that it poisons them. This becomes accelerated the more you fertilize.

On the other hand, too alkaline a soil decreases nutrient availability. It causes loss of soil structure and development of "puddling". Strong alkalinity dissolves and disperses humus. "Black alkali" is caused by the accumulation of alkali and humus at the surface of the soil. Strong alkalinity causes a concentration of salts that completely inhibit plant growth.

TO RAISE OR LOWER pH OF YOUR SOIL

Raising and lowering pH is not an exact science and most plants have a reasonably wide tolerance, certainly to within 1 pH point. Consult plant pH preferences in this booklet and you will see that the majority can manage well on a pH around 6.5 but some need an alkaline soil and some a particularly acid soil. Altering pH takes time so do not expect rapid changes; rather, work steadily towards giving a plant its ideal conditions.

ADDING LIME TO INCREASE pH

Lime can be added at any time of year but it does need time to take effect – which is why the autumn, winter and early spring are the preferred times.

The two main types of lime are ground limestone and hydrated lime. Ground limestone is slower acting but more pleasant to handle. Hydrated lime may take effect in two or three months but ground chalk or limestone may take up to six months.

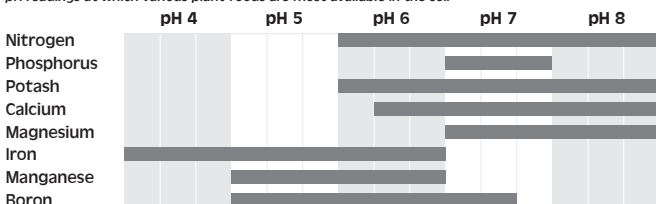
The amount of lime needed to raise a spade's depth of top soil by 1 pH varies from 5.5 oz. of hydrated lime or 7.5 oz. ground limestone on sandy soil to 11 oz. of hydrated lime or 15 oz. ground limestone on heavy clays or peaty soils per square yard. So do not expect pH correction to be too precise!

Avoid adding lime at the same time as sulfate of ammonia, superphosphate, basic slag or animal manures. Lime may be used in combination with sulfate of potash or muriate of potash.

It is because of the natural drop in pH that there is such an emphasis on adding lime. While lime stimulates the availability of most plant foods, you will see from the "pH and Plant Nutrient" table that soils should not automatically be limed because large amounts of plant food become increasingly "locked up" over pH7.

pH and Plant Nutrient Availability

pH readings at which various plant foods are most available in the soil



BENEFITS OF LIMING

- Reduces acidity, increases pH.
- Binds the fine particles of clay into larger particles and so helps aerate and drain the soil.
- Helps to retain moisture and plant foods in sandy soils.
- Balances the addition of acidic fertilizers; nitrochalk is an example.
- The lime content of soil will sometimes affect flower and foliage color. Blue & red hydrangea flowers are the most common examples.
- Supplies the plant food calcium.
- Makes nitrogen available by stimulating the micro-organisms that help decompose organic matter.
- Increases the earthworm population.
- Protects against a few diseases, such as club root in brassicas (but causes scab in potatoes) and is disliked by organisms that help decompose organic matter.

ADDING CHEMICALS AND ORGANICS TO REDUCE pH

The best way to reduce pH is to use the compost heap and farmyard manure to regularly introduce decaying humus. This not only reduces pH gradually but helps hold plant foods and moisture. Peat, relatively inert and usually only about 4% nitrogen content, is another useful soil conditioner of an acid nature.

Sulfate of ammonia and flowers of sulfur are chemical treatments and sulfate of ammonia also adds nitrogen.

While the tiny bacteria and micro-organisms work unseen in the soil, breaking down fresh organic matter into plant food, they produce acids. But if this process eventually creates too low a pH the organisms will work less efficiently, and lime is then needed as a balance and stimulant.

It is sensible to progress gradually towards a reduced pH and certainly not to expect to be able to be precise in exactly how much of a material will reduce pH by a given amount.

Avoid adding animal manures or sulfate of ammonia at the same time as lime or basic slag (a phosphate food).

HOW MUCH TO APPLY

How much to apply depends on the particle size of your soil. A sandy soil needs less lime for an equivalent pH change than a heavy clay but will not hold its pH as long.

SOIL TYPES

Sandy Soils: A light, coarse soil comprised of crumbling and alluvial debris.

Loam Soils: A medium friable soil, consisting of a blend of coarse (sand) alluvium and fine (clay) particles mixed within fairly broad limits with a little lime and humus.

Clay Soils: A heavy, clinging, impermeable soil, comprised of very fine particles with little lime and humus and tending to be waterlogged in winter and very dry in summer.

To increase soil by 1 pH (more alkaline):

Material	pH Change	Sandy	Loamy	Clay
Dolomitic or calcic limestone	+0.5 unit (0.5 pH)	2.5	5.0	5.5
	+1.0 unit (1.0 pH)	5.0	8.5	11.0
Hydrated Lime	+0.5 unit (0.5 pH)	1.5 - 2.0	3 - 4	4.0 - 4.5
	+1.0 unit (1.0 pH)	3.5 - 4.0	6.0 - 6.5	8.0 - 8.5
Iron Sulfate	-0.5 unit (0.5 pH)	0.75	1.5	2.0
	-1.0 unit (1.0 pH)	1.5	3.0	4.0
Aluminum Sulfate	-0.5 unit (0.5 pH)	0.5 - 0.75	1 - 1.25	1.5
	-1.0 unit (1.0 pH)	1 - 1.25	2.25	3.0

Amounts listed are pounds per 100 square feet. Do not add more than 5lbs. of lime or sulfur in one application.

Please note: To use Sphagnum Peat Moss to increase soil acidity, mix in up to one third total soil volume when planting acid loving plants.

GARDENING TIPS

- Altering the pH takes time. Do not expect instant changes, but work steadily towards the ideal range. Most plants have a "range" of pH. Consult your "tables" for the pH range of your plants.
- Adding lime before planting is most beneficial because it takes time to take effect. Liming in the fall, winter or early spring is preferred.
- Avoid adding lime at the same time as fertilizers whether they are organic or chemical.
- When testing a lawn, water thoroughly and push the probes into the soil up to the plastic case base.
- Use lime sparingly. It encourages weeds and worms. Worms then attract moles.
- Save clippings, vegetable & fruit wastes for compost.
- Bone meal is an excellent fertilizer to be used at the time of planting.

PLANT pH PREFERENCE LIST

NAME	pH RANGE	NAME	pH RANGE	NAME	pH RANGE	NAME	pH RANGE	NAME	pH RANGE
FLOWERS, TREES & SHRUBS		GOLDEN ROD	5.0 - 7.0	WATER LILY	5.5 - 6.5	HOP	6.0 - 7.5	FERNS, MAIDENHAIR	6.0 - 8.0
ABELIA	6.0 - 8.0	GYPSOPHILIA	6.0 - 7.5	WEIGELIA	6.0 - 7.5	HUCKLEBERRY	4.0 - 6.0	FERNS, RABBITS FOOT	6.0 - 7.5
ACACIA	6.0 - 8.0	HAWTHORN	6.0 - 7.0	WISTARIA	6.0 - 8.0	LEMON	6.0 - 7.0	FERNS, SPLEENWORT	6.0 - 7.5
ACANTHUS	6.0 - 7.0	HEATH	4.5 - 6.0	ZINNIA	5.5 - 7.5	LYCHEE	6.0 - 7.0	FIG	5.0 - 6.0
ACONITUM	5.0 - 6.0	HEATHER	4.0 - 6.0	VEGETABLES & HERBS		MANGO	5.0 - 6.0	FITTONIA	5.5 - 6.5
ADONIS	6.0 - 8.0	HELIANTHUS	5.0 - 7.0	ARTICHOKE	6.5 - 7.5	MELON	5.5 - 6.5	FREESIA	6.0 - 7.5
AGERATUM	6.0 - 7.5	HELLEBORUS	6.0 - 7.5	ASPARAGUS	6.0 - 8.0	MULBERRY	6.0 - 7.5	GARDENIA	5.0 - 6.0
AILANTHUS	6.0 - 7.5	HOLLY	5.0 - 6.5	BASIL	5.5 - 6.5	NECTARINE	6.0 - 7.5	GENISTA	6.5 - 7.5
AJUGA	4.0 - 6.0	HOLLYHOCK	6.0 - 7.5	BEAN	6.0 - 7.5	PEACH	6.0 - 7.5	GERANIUM	6.0 - 8.0
ALTHEA	6.0 - 7.5	HONEYSUCKLE	6.0 - 7.5	(RUNNER, BROAD, FRENCH)		PEAR	6.0 - 7.5	GLOXINIA	5.5 - 6.5
ALYSSUM	6.0 - 7.5	HYACINTH	6.5 - 7.5	BEETROOT	6.0 - 7.5	PINEAPPLE	5.0 - 6.0	GRAPE IVY	5.0 - 6.5
AMARANTHUS	6.0 - 6.5	HYDRANGEA, BLUE	4.0 - 5.0	BROCCOLI	6.0 - 7.0	PLUM	6.0 - 7.5	GRAPE HYACINTH	6.0 - 7.5
ANCHUSA	6.0 - 7.5	HYDRANGEA, PINK	6.0 - 7.0	BRUSSELS SPROUTS	6.0 - 7.5	POMEGRANATE	5.5 - 6.5	GREVILLEA	5.5 - 6.5
ANDROSACE	5.0 - 6.0	HYDRANGEA, WHITE	6.5 - 8.0	CABBAGE	6.0 - 7.5	QUINCE	6.0 - 7.5	GYNURA	5.5 - 6.5
ANEMONE	6.0 - 7.5	HYPERICUM	5.5 - 7.0	CALABRESE	6.5 - 7.5	RASPBERRY	5.0 - 7.5	HEDERA (IVY)	6.0 - 8.0
ANTHYLLIS	5.0 - 6.0	IRIS	5.0 - 6.5	CARROT	5.5 - 7.0	RHUBARB	5.5 - 7.0	HELIOTROPISM	5.0 - 6.0
ARBUTUS	4.0 - 6.0	IVY	6.0 - 7.5	CAULIFLOWER	5.5 - 7.5	STRAWBERRY	5.0 - 7.5	HENS AND CHICKENS	6.0 - 7.0
ARENARIA	6.0 - 8.0	JUNIPER	5.0 - 6.5	CELERY	6.0 - 7.0	WATERMELON	5.5 - 6.5	HERRINGBONE PLANT	6.0 - 6.0
ARISTEA	6.0 - 7.5	KALMIA	4.5 - 5.0	CHICORY	5.0 - 6.5	HOUSE & GREENHOUSE PLANTS		HIBISCUS PLANT	6.0 - 8.0
ARMERIA	6.0 - 7.5	KERRIA	6.0 - 7.0	CHINESE CABBAGE	6.0 - 7.5	ABUTILON	5.5 - 6.5	HOYA	5.0 - 6.5
ARNICA	5.0 - 6.5	LAUREL	6.5 - 7.5	CHIVES	6.0 - 7.0	ACORUS	5.0 - 6.5	IMPATIENS	5.5 - 6.5
ASPERULA	6.0 - 8.0	LAVENDER	6.5 - 7.5	CORN - SWEET	5.5 - 7.0	AECHMEA	5.0 - 5.5	IVY TREE	6.0 - 7.0
ASPHODOLINE	6.0 - 8.0	LIATRIS	5.5 - 7.5	CRESS	6.0 - 7.0	AFRICAN VIOLET	6.0 - 7.0	JACARANDA	6.0 - 7.5
ASTER	5.5 - 7.5	LIGUSTRUM	5.0 - 7.5	COURGETTES	5.5 - 7.0	AGLAONEMA	5.0 - 6.0	JAPANESE SEDGE	6.0 - 8.0
AUBRITA	6.0 - 7.5	LILAC	6.0 - 7.5	CUCUMBER	5.5 - 7.5	AMARYLIS	5.5 - 6.5	JASMINUM	5.5 - 7.0
AZALEA	4.5 - 6.0	LILY OF THE VALLEY	4.5 - 6.0	FENNEL	5.0 - 6.0	ANTHURIUM	5.0 - 6.0	JERUSALEM CHERRY	5.5 - 6.5
BALLOON FLOWER	6.0 - 6.5	LITHOSPERMUM	5.0 - 6.5	GARLIC	5.5 - 7.5	APHELANDRA	5.0 - 6.0	JESSAMONE	5.0 - 6.0
BAYBERRY	4.0 - 6.0	LOBELIA	6.5 - 7.5	GINGER	6.0 - 8.0	ARAUCARIA	5.0 - 6.0	KALANCHOE	6.0 - 7.5
BERGENIA	6.0 - 7.5	LUPINUS	5.5 - 7.0	HORSERADISH	6.0 - 7.0	ASPARAGUS FERN	6.0 - 8.0	KANGAROO THORN	6.0 - 8.0
BLEEDING HEART	6.0 - 7.5	MAGNOLIA	5.0 - 6.0	KALE	6.0 - 7.5	ASPIDISTRA	4.0 - 5.5	KANGAROO VINE	5.0 - 6.5
BLUEBELL	6.0 - 7.6	MAHONIA	6.0 - 7.0	KOHLRABI	6.0 - 7.5	AZAEA	4.5 - 6.0	LANTANA	5.5 - 7.0
BROOM	5.0 - 6.0	MARIGOLD	5.5 - 7.0	LEEK	6.0 - 8.0	BABY'S BREATH	6.0 - 7.5	LAURUS (BAY TREE)	5.0 - 6.0
BUDDLEIA	6.0 - 7.0	MOLINIA	4.0 - 5.0	LENTIL	5.5 - 7.0	BABY'S TEARS	5.0 - 6.0	LEMON PLANT	6.0 - 7.5
BUPHTHALUM	6.0 - 8.0	MORAEA	5.5 - 6.5	LETTUCE	6.0 - 7.0	BECONIA	5.5 - 7.0	MIMOSA	5.0 - 7.0
BUTTERFLY BUSH	4.0 - 6.0	MORNING GLORY	6.0 - 7.5	MARJORAM	6.0 - 8.0	BIRD OF PARADISE	6.0 - 6.5	MIND YOUR OWN BUSINESS	5.0 - 5.5
CALENDULA	5.5 - 7.0	MOSS	6.0 - 8.0	MARROW	6.0 - 7.5	BISHOP'S CAP	5.0 - 6.0	MONSTERA	5.0 - 6.0
CAMASSIA	6.0 - 8.0	MOSS, SPHAGNUM	3.5 - 5.0	MILLET	6.0 - 6.5	BLACK-EYED SUSAN	5.5 - 7.5	MYRTLE	6.0 - 8.0
CANDYTUFT	6.0 - 7.5	MYOSOTIS	6.0 - 7.0	MINT	7.0 - 8.0	BLOOD LEAF	5.5 - 6.5	NEVER NEVER PLANT	5.0 - 6.0
CANNA	6.0 - 8.0	NARCISSUS	6.0 - 8.5	MUSHROOM	6.5 - 7.5	BOTTLEBRUSH	6.0 - 7.5	NICODEMIA (INDOOR OAK)	6.0 - 8.0
CANTERBURY BELLS	7.0 - 7.5	NASTURTIUM	5.5 - 7.5	MUSTARD	6.0 - 7.5	BOUGAINVILLEA	5.5 - 7.5	NORFOLK ISLAND PINE	5.0 - 6.0
CARDINAL FLOWER	4.0 - 6.0	NICOTIANA	5.5 - 6.5	OLIVE	5.5 - 6.5	BOXWOOD	6.0 - 7.5	OLEANDER	6.0 - 7.5
CARNATION	6.0 - 7.5	PACHYSANDRA	5.0 - 8.0	ONION	6.0 - 7.0	BROMELIADS	5.0 - 7.5	OPILISMENUS	5.0 - 6.0
CATALPA	6.0 - 8.0	PAEONIA	6.0 - 7.5	PAPRIKA	7.0 - 8.5	BUTTERFLY FLOWER	6.0 - 7.5	ORCHID	4.5 - 5.5
CELOSIA	6.0 - 7.0	PANSY	5.5 - 7.0	PARSLEY	5.0 - 7.0	CACTI	4.5 - 6.0	OXALIS	6.0 - 8.0
CENTAUREA	5.0 - 6.5	PASSION FLOWER	6.0 - 8.0	PARSNIP	5.5 - 7.5	CALCAOLARIA	6.0 - 7.0	PALMS	6.0 - 7.5
CERASTIUM	6.0 - 7.0	PASQUE FLOWER	5.0 - 6.0	PEA	6.0 - 7.5	CALADIUM	5.0 - 6.0	PANDANUS	5.0 - 6.0
CHRYSANTHEMUM	6.0 - 7.0	PAULOWNIA	6.0 - 8.0	PEANUT	5.0 - 6.5	CALLA LILY	6.0 - 7.0	PEACOCK PLANT	5.0 - 6.0
CISSUS	6.0 - 7.5	PENSTEMON	5.5 0 7.0	PECAN	4.0 - 6.0	CAMELIA	4.5 - 5.5	PELLIONIA	5.0 - 6.0
CISTUS	6.0 - 7.5	PERIWINKLE	6.0 - 7.5	PEPPER	5.5 - 7.0	CAMPANULA	5.5 - 6.5	PEPEROMIA	5.0 - 6.0
CLARKIA	6.0 - 6.5	PETUNIA	6.0 - 7.5	PEPPERMINT	6.0 - 7.5	CAPSICUM	5.0 - 6.5	PHILODENDRON	5.0 - 6.0
CLIANTHUS	6.0 - 7.5	PINKS	6.0 - 7.5	PISTACHIO	5.0 - 6.0	CARDINAL FLOWER	5.0 - 6.0	PILEA	6.0 - 8.0
CLEMATIS	5.5 - 7.0	POLYGONUM	6.0 - 7.5	POTATO	4.5 - 6.0	CASTOR OIL PLANT	5.5 - 6.5	PLUMBAGO	5.5 - 6.5
COLCHICUM	5.5 - 6.5	POLYANTHUS	6.0 - 7.5	POTATO - SWEET	5.5 - 6.0	CANTURY PLANT	5.0 - 6.5	PODACARPUS	5.0 - 6.5
COLUMBINE	6.0 - 7.0	POPPY	6.0 - 7.5	PUMPKIN	5.5 - 7.5	CHINESE EVERGREEN	5.0 - 6.0	POINTSETTIA	6.0 - 7.5
CONVOLVULUS	6.0 - 8.0	PORTULACA	5.5 - 7.5	RADISH	6.0 - 7.0	CHINESE PRIMROSE	6.0 - 7.5	POLYSCIAS	6.0 - 7.5
COREOPSIS	5.0 - 6.0	PRIMROSE	5.5 - 6.5	RICE	5.0 - 6.5	CHRISTMAS CACTUS	5.0 - 6.5	POTHOS	5.0 - 6.0
CORONILLA	6.5 - 7.5	PRIMULA	6.0 - 7.5	ROSEMARY	5.0 - 6.0	CINERARIA	5.5 - 7.0	PRAYER PLANT	5.0 - 6.0
CORYDALIS	6.0 - 8.0	PRIVET	5.0 - 7.5	SAGE	5.5 - 6.5	CLERODENDRUM	5.0 - 6.0	PUNICA	5.5 - 6.5
COSMOS	5.0 - 8.0	PRUNELLA	6.0 - 7.5	SHALLOT	5.5 - 7.0	CLIVIA	5.5 - 6.5	SANSERIERIA	4.5 - 7.0
COTTONEASTER	6.0 - 8.0	PRUNUS	6.5 - 7.5	SORGHUM	5.5 - 7.5	COCKSCOMB	6.0 - 7.0	SAXIFRAGA	6.0 - 8.0
CRAB APPLE	6.0 - 7.5	PYRETHRUM	6.0 - 7.5	SOYBEAN	5.5 - 6.5	COFFEE PLANT	5.0 - 6.0	SCINDAPSUS	5.0 - 6.0
CROCUS	6.0 - 8.0	RED HOT POKER	6.0 - 7.5	SPEARMINT	5.5 - 7.5	COLEUS	6.0 - 7.0	SHRIMP PLANT	6.0 - 7.0
CYNOGLOSSUM	6.0 - 7.5	RHODODENDREN	4.5 - 6.0	SPINACH	6.0 - 7.5	COLUMNEA	4.5 - 5.5	SPANISH BAYONET	6.0 - 7.5
DAFFODIL	6.0 - 6.5	ROSES, HYBRID TEA	5.5 - 7.0	SWEDE	5.0 - 7.0	CORAL BERRY	5.5 - 7.5	SPIDER PLANT	6.0 - 7.5
DAHLIA	6.0 - 7.5	ROSES, CLIMBING	6.0 - 7.0	THYME	5.5 - 7.0	CRASSULA	5.0 - 6.0	SUCCULENTS	5.0 - 6.5
DAY LILY	6.0 - 8.0	ROSES, RAMBLING	5.5 - 7.0	TOMATO	5.5 - 7.5	CREeping FIG	5.0 - 6.0	SYNOGONIUM	5.0 - 6.0
DELPHINIUM	6.0 - 7.5	SALVIA	6.0 - 7.5	TURNIP	5.5 - 7.0	CROTON	5.0 - 6.0	TOLMIEA	5.0 - 6.0
DEUTZIA	6.0 - 7.5	SCABIOSA	5.0 - 7.5	WATER CRESS	6.0 - 8.0	CROWN OF THORNS	6.0 - 7.5	TRADESCANTIA	5.0 - 6.0
DIANTHUS	6.0 - 7.5	SEDUM	6.0 - 7.5	FRUIT		CUPHEA	6.0 - 7.5	UMBRELLA TREE	5.0 - 7.5
DOGWOOD	5.0 - 7.0	SNAPDRAGON	5.5 - 7.0	APPLE	5.0 - 6.5	CYCLAMEN	6.0 - 7.0	VENUS FLYTRAP	4.0 - 5.0
EDELWEISS	6.5 - 7.5	SNOWDROP	6.0 - 8.0	APRICOT	6.0 - 7.0	CYPERUS	5.0 - 7.5	WEeping FIG	5.0 - 6.0
ELAEAGNUS	5.0 - 7.5	SOAPWORT	6.0 7.5	AVOCADO	6.0 - 7.5	DIFFENBACHIA	5.0 - 6.0	YUCCA	6.0 - 7.5
ENKIANTHUS	5.0 - 6.0	SPEEDWELL	5.5 - 6.5	BANANA	5.0 - 7.0	DIPLODENIA	6.0 - 7.5	ZEBRINA	5.0 - 6.0
EUPHORBIA	6.0 - 7.0	SPIRAEA	6.0 - 7.5	BLACKBERRY	5.0 - 6.0	DIZGOTHECA	6.0 - 7.5	TURF & ORNAMENTAL GRASSES	
EVERLASTINGS	5.0 - 6.0	SPRUCE	4.0 - 5.0	BLUEBERRY	4.0 - 6.0	DRACAENA	5.0 - 6.0	BAHAI	6.5 - 7.5
FIRETHORN	6.0 - 8.0	STOCK	6.0 - 7.5	CANTALOUPE	6.5 - 7.5	EASTER LILY	6.0 - 7.0	BENT	5.5 - 6.5
FORGET-ME-NOTS	6.0 - 7.0	STONECROP	6.5 - 7.5	CHERRY	6.0 - 7.5	ELEPHANT'S EAR	5.0 - 6.0	BERMUDA	6.0 - 7.0
FORSYTHIA	6.0 - 8.0	SUMACK	5.0 - 6.5	CRANBERRY	5.5 - 6.5	EPISCIA	6.0 - 7.0	CANADA BLUE	4.5 - 6.4
FOXGLOVE	6.0 - 7.5	SUNFLOWER	5.0 - 7.0	CURRENT, BLACK	6.0 - 8.0	EUONYMOUS	6.0 - 8.0	CLOVER	6.0 - 7.0
FRITILLARIA	6.0 - 7.5	SWEET PEA	6.0 - 7.5	CURRENT, RED	5.5 - 7.0	FERNS, BIRD'S NEST	5.0 - 5.5	KENTUCKY BLUE	6.0 - 7.5
FUCHSIA	5.5 - 7.5	SWEET WILLIAM	6.0 - 7.5	DAMSON	6.0 - 7.5	FERNS, BOSTON	5.5 - 6.5	MEADOW	6.0 - 7.5
GAILLARDIA	6.0 - 7.5	TAMARIX	6.5 - 8.0	GOOSEBERRY	5.0 - 6.5	FERNS, BUTTON	6.0 - 8.0	PAMPAS	6.0 - 8.0
GAZANIA	5.5 - 7.0	TRILLIUM	5.0 - 6.5	GRAPEVINE	6.0 - 7.0	FERNS, CHRISTMAS	6.0 - 7.5	RED TOP	6.0 - 6.5
GENTIANA	5.0 - 7.5	TULIP	6.0 - 7.0	HAZELNUT	6.0 - 7.0	FERNS, CLOAK	6.0 - 7.5	RYE	6.0 - 7.0
GEUM	6.0 - 7.5	VIBERNUM	5.0 - 7.5			FERNS, FEATHER	5.5 - 6.5	ST. AUGUSTINE	6.5 - 7.5
GLADIOILI	6.0 - 7.0	VIOLA	5.5 - 6.5			FERNS, HART'S TONGUE	7.0 - 8.0	TALL FESCUE	6.0 - 7.0
GLOBULARIA	5.5 - 7.0	VIRGINIA CREEPER	5.0 - 7.5			FERNS, HOLLY	4.5 - 6.0	VELVET BENT	5.0 - 6.0
GODETIA	6.0 - 7.5	WALLFLOWER	5.5 - 7.5						

PLANT LIGHT PREFERENCE LIST

MAXIMUM FOOT-CANDLE HOURS: 50,000, MINIMUM FOOT-CANDLE HOURS: 25,000
This category of plants will thrive in full sunlight for medium short periods. East and South exposures are preferred.

BULBS

Agapanthus	Amaryllis	Anemone	Calla Lily
Freesia	Hoemanthus	Ixia	Montbretia
Oxalis	Ranunculus	Tulbaghia	

FLOWERING PLANTS

Bird Of Paradise	Chrysanthemum	Geranium	Gerbera
Gloriosa	King's Crown	Lilies	Miniature Rose
Passion Flower	Poinsettia	Shrimp Plant	

FOLIAGE PLANTS

Agave	Aloe	Aporocactus	Astorphytum
Bamboo	Caphalocereus	Echeveria	Enchinocactus
Echinocereus	Echinopsis	Eucalyptus	Gymnocalycium
Gynura	Herbs	Iresine	Jerusalem Cherry
Kalanchoe	Lobiva	Mamillaria	Notocactus
Opuntia	Pereskia	Polyscias	Rebutia
Sedum	Stapelia		

SHRUBS

Acalypha	Allamanda	Azalea	Bouganvillea
Citrus	Coccoloba	Croton	Flowering Maple
Hibiscus	Hydrangea	Ixora	Myrtle
Oleander	Privet	Pyracantha	Rhododendron
Stephanotis			

MAXIMUM FOOT-CANDLE HOURS: 37,500, MINIMUM FOOT-CANDLE HOURS: 20,000
This category requires bright light with little direct sunlight. East and West exposures are preferred.

BULBS

Clivia	Daffodil	Hyacinth	Narcissus
Tulip			

FLOWERING PLANTS

Cineraria	Crossandra	Cyclamen	Flame
Violet	Gloxinia	King's Crown	Lipstick Vine
Shrimp Plant			

FOLIAGE PLANTS

Beaucarnea	Coleus	Columnea	Crassula
Dizygotheca	Euphorbia	Fatsia	Fittonia
Gynura	Haworthia	Hypoestes	Joseph's Coat
Pleomele	Rhipsalas	Rhoeo	Saxifraga
String-of-pearls	Swedish Ivy	Tomiea	Tradescantia Wax
Plant	Zebra Plant	Zebrina	

SHRUBS

Ardisia	Aucuba	Camellia	Clerodendrum
Coffea	Dipladenia	Eleagnus	Eunonymus
Fuchsia	Gardenia	Nandina	Silk Oak

MAXIMUM FOOT-CANDLE HOURS: 27,500, MINIMUM FOOT-CANDLE HOURS: 15,000
Plants in this category thrive on bright indirect light with no direct sun light. North exposures are preferred. Subdued light by screening or a lightweight curtain will be adequate at East, South or West exposures.

BULBS

Caladium

FLOWERING PLANTS

Achimenes	African	Violet	Begonia
Christmas Cactus	Flowering Tobacco	Impatiens	Orchids

FOLIAGE PLANTS

Acorus	Anthurium	Brassia	Bromeliads
Cissus	Helxine	Hypoestes	Norfolk Island
Pine Pandanus	Pellionia	Peperomia	Pilea
Prayer Plant			

MAXIMUM FOOT-CANDLE HOURS: 15,500, MINIMUM FOOT-CANDLE HOURS: 7,500
The plants in this category are best suited to dim light. Light intensities within the interior of a room away from windows are preferred.

FOLIAGE PLANTS

Asparagus	Aspidistra	Chlorophytum	Chinese
Evergreen			
Cyperus	Dieffenbachia	Dracena	English Ivy Ferns
Ficus Liriope	Palms	Philodendron	Pothos
Selaginella	Snake Plant	Spathiphyllum	Syngonium

SHRUBS

Pittsoporum	Podocarpus
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