CROP	DESCRIPTION	FERTILIZERS	WATER REQUIREMENT (mm/d)	PESTICIDES
Barley	Barley is cultivated as a food cereal in the tropics and subtropics in India. The straw produced is used as an animal feed, bedding and to cover roofs of houses. In temperate regions, barley is used in malt production to brew beer and make other distilled alcoholic beverages, particularly whisky. Barley can be grown in Spring or Fall. It requires temperatures	→Adequate Nitrogen best yield(in lb. N/acre) Warmer-tillage area: 100 Warmer no-till area: 70 Cooler tillage area: 150 Cooler no-till area: 120 →Banding phosphorus (P) with or near the seed in barley at planting is very important for highest yield On an average it uses 20-25 pounds P/acres and it depends upon planter spacing and type →Sulphur deficiency occurs due to rainfall or snowfall, so	6.05	Cyprodinil: Used as a foliar fungicide and as a seed dressing on barley. Fenbuconazole : it is use as an agricultural and horticultural fungicide spray for the control of leaf spot, yellow and brown rust, powdery mildew and net blotch on wheat and barley

	to have reached a minimum of 1–2°C (34–36°F) for successful germination. The stem is made up of nodes and internodes. The nodes are solid, whereas the internodes are hollow. The stem supports the inflorescence, or spike, where the grain is produced. Barley seeds heads are cylindrical spikes composed of rachis each with 3 spikelet. Each spike produces 20–60 grains.	farmer should use 10 pounds S/acre if land was wet.		
Beans	These are another staple in many diets around the world. Generally cheap to buy,	→Nitrogen: In general, compost is a good soil amendment for adequate bean plant growth,	6.05	Boscalid: used on specialty crops Carbendazim (MBC):

	dried beans and legumes tend to also have a long shelf life, making them good for seasons when food is more scarce. They are a high quality source of protein, although on their own they tend to be less tasty and need to be combined with other foods to make them palatable. Besides protein, they contain fibre, carbohydrate, minerals and vitamins needed by the human body. They don't have vitamin C unless sprouted and eaten as sprouts.	because it improves soil texture while providing light amounts of macronutrients, like nitrogen. However, if the soil in which you are planting beans is exceptionally low in nutrients, a small amount of nitrogen fertilizer may be needed prior to planting. →Phosphorus: Phosphorus primarily helps a bean plant's root system grow. Because beans are not heavy feeders of any nutrients, a 3-inch layer of compost may be all that's needed		Found to be acutely toxic to honeybees, having an effect on long term survival of colonies. Dicloran: Widely used fungicide used on a variety of ornamentals Fludioxonil: A fungicide used to control fungal disease, making it a useful seed treatment as well as a post-harvest treatment Pyraclostrobin: Controls foliar fungal diseases

		for this element of bean plant growth. →Potassium: Potassium is a supporting player when it comes to bean plant growth. it keeps plants healthy enough to support that growth. A light feeding of compost is generally all bean plants need for adequate potassium. → If using synthetic fertilizer, look for a 5-10-10 blend, which indicates that the blend has less nitrogen than phosphorus and potassium.		
Banana	The banana plant, is the world's largest	Banana trees are heavy feeders so they need to be	6.6	Azoxystrobin: This chemical does not

	herbaceous perennial The fruit is the most widely used part of the plant Bananas grow best in hot and humid climates, require a rainfall of at least 1000 mm (39.4 in) per year to survive and have a high light requirement. Banana plants grow optimally at 27°C (98.6°F) and require a deep soil, rich in organic matter which is well draining and well aerated. The plants will grow optimally in soil with a pH between 5.5 and 7.0. The desired pieces of the plant are	regularly fertilized to be productive. →When fertilizing a mature banana plant, use 1 ½ pounds of 8-10-10 per month; for dwarf indoor plants, use half that amount. Dig this amount in around the plant and allow it to dissolve each time the plant is watered. →Or you can give the banana a lighter application of fertilizer each time it is watered. Mix the fertilizer with the water and apply as you irrigate. When the soil dries out to about ½ inch,	The banana plants are fast growing and require the frequent addition of nutrients as well as additional irrigation in the dry season.	leach and is unlikely to contaminate water bodies. It is found to exhibit very low ecological risks, to aquatic life, birds, and mammals Carbendazim (MBC): Found to be acutely toxic to honeybees, having an effect on long term survival of colonies. Chlorpyrifos: Insecticide effective in controlling cutworms, corn rootworms, cockroaches, grubs,

	usually planted 30–60 cm (11.8–23.6 in) deep in the soil and should generally be planted at the end of the dry season or the beginning of the wet season. Banana is often grown alongside other crop plants with similar requirements	water and fertilize again. →If you are choosing to use high nitrogen and high potassium fertilizers, add the high nitrogen food to the soil once a month during the growing season at full dose. When the plant begins to flower, cut back on the high-nitrogen fertilizer and switch to one that is high in potassium. Stop fertilizing if the soil has a pH of 6.0 or under or when the plant begins to fruit.		flea beetles, flies, termites, fire ants, and lice.
Broccoli	It is an herbaceous annual or biennial grown for its edible flower heads which are used	→Broccoli plants are heavy feeders and will do well with a dose of	5.5 Broccoli requires regular	Carbendazim (MBC): Found to be acutely toxic to honeybees,

	as a vegetable. Broccoli heads are consumed after boiling or fresh in salads. It can be processed for freezing and drying. Broccoli is a cool season crop which can be grown both in spring and in fall. The plants thrive in cool climates and should be planted for fall in areas with hot summers. Broccoli grows best in moist, fertile soil with a slightly acidic pH between 6.0 and 7.0 and at temperatures between 15.5 and 18°C. Provide the plants with adequate and even	fertilizer every couple of weeks. →Use a balanced granular type fertilizer, 10-10-10 or 14-14-14. Apply it at a rate of 1 1/2 pounds per 100 square feet. Scatter the granules around the plants. Try not to let the granules touch the broccoli plants as it may burn them. Once the granules are scattered, water them in well. You can start applying granular fertilizer when the seedlings have been transplanted and are 4-5 inches tall.	water, especially during drought, to prevent the plants from going to seed. Plant broccoli in full sun to ensure optimum head size.	having an effect on long term survival of colonies. Methamidophos: A highly active, systemic, residual organophosphate insecticide.

	moisture (about 2 in a week) to keep plants fertile and prevent them from bolting and avoid wetting the flower heads as they develop. Mulching around the plants helps to conserve soil moisture and reduces the soil temperature.	→ If you decide to use a water soluble product, start fertilizing broccoli plants as soon as you transplant them. → If you decide to fertilize with an organic fertilizer, just make sure it is well balanced. Use organic products like fish emulsions		
Cucumber	Cucumber, is a warm season, vining, annual plant cucumbers are used as a fresh vegetable, consumed fresh in salads. Some varieties are grown specifically for pickling. Cucumbers	→Well-aged compose: best source of nutrients for cucumbers. Compost only has 2 percent nitrogen, and it releases slowly over many years. Compost can be applied yearly as mulch or worked into your soil	4.95	Pyraclostrobin: Controls foliar fungal diseases

	require warm, dry conditions to develop optimally, preferring both warm days and warm nights and growing best at a temperature of 30°C (86°F). Cucumbers will yield best if grown in a fertile, well-draining soil, rich in organic matter and with a pH between 6.5 and 7.5. Cucumbers are very sensitive to cold and should be planted in full sun and provided with ample soil moisture due to their shallow root system.	without causing excess nutrient buildup. It also supplies phosphorus, potassium and micronutrients that cucumbers need. →Cucumbers have low nitrogen requirements, but they need high potassium and high phosphorus levels with a N-P-K ratio similar to 2-3-6.		
Carrots	Carrot, is an edible, biennial herb The carrot plant produces a rosette	→Potash: Potash provides potassium. Potassium is essential in carrot plants for	5.5	Boscalid: used on specialty crops

	of 8–12 leaves above ground and a fleshy conical taproot below ground. Carrot roots are eaten as a vegetable and can be consumed fresh or cooked. The leaves of the plant can be used as feed for animals. Carrots are cool-season crops which can be planted in early Spring and left in the ground all summer for harvest in the fall. Carrots grow best in a well-draining, loose, sandy soil which is free of large rocks and has a pH between 5.5 and 7.0. They require full sun for	photosynthesis, water and nutrient transport and plant cooling. Leaves of potassium deficient carrots curl backwards and have scorched margins. →Kelp: Kelp is an organic source of micronutrients, including calcium, magnesium and boron, which are often deficient in carrot plants. Calcium-deficient carrot plants have collapsed stems and withered leaves. →If a soil analysis indicates a deficiency in all three macronutrients, NPK can be applied 30 days after germination. Symptoms of macronutrient deficiencies		Dicloran: Widely used fungicide used on a variety of ornamentals Pendimethalin: herbicide found to not be toxic to bees or mammals but highly toxic to aquatic invertebrates and fish. Chlorpyrifos: Insecticide effective in controlling cutworms, corn rootworms, cockroaches, grubs, flea beetles, flies, termites, fire ants, and lice.

	optimum development but will tolerate some very light shade. The optimum temperature for their growth is between 16 and 24°C. Carrot seedlings are very sensitive to extremes of temperature, so temperatures below 10°C (50°F) tend to cause the development of longer, paler roots. The plants also require plenty moisture and organic matter.	include pale or purple leaves that die off quickly and dwarfed plants. For best results, select an NPK with 1-1-1 or 1-2-2 on the label...		
Cabbage	The cabbage plant, is an herbaceous annual or biennial vegetable. The plant is usually grown as an annual. Cabbage is	Growing cabbage also usually demands soil preparation prior to planting, After the initial growth stages, further	5.5 Cabbage should be kept evenly watered	Fenbuconazole : it is use as an agricultural and horticultural fungicide

	primarily grown for consumption as a vegetable, eaten after boiling or steaming. Some cultivars are grown as fodder for animals. Cabbage is cool season crop that grows best in cool, moist conditions. The plant will grow best at temperatures between 4 and 21°C (40–50°F) allowing it to be grown in both Spring and Fall. Cabbage will grow optimally in a rich, moist, well draining soil With a pH of 6.5. The plant requires at least six hours of direct sunlight	fertilization helps the plant mature into a big, tasty vegetable. →Before planting: Shovel 2 to 4 inches of rich compost onto the garden plot, and scatter pellets from a general purpose fertilizer (composition ratings of 10-10-10 or 16-16-8) over the plot. Use 4 to 6 cups of fertilizer for every 100 square feet of garden plot →Turn the top 6 to 8 inches of soil over, so as to thoroughly mix the added fertilizer and compost. Plant your	to ensure the development of tight heads. Uneven watering can cause heads to crack.	spray for the control of leaf spot, yellow and brown rust, powdery mildew Pendimethalin: herbicide found to not be toxic to bees or mammals but highly toxic to aquatic invertebrates and fish. Cyfluthrin: Insecticide used to control cabbageworm. It is also used in public health situations and for structural pest control. Methamidophos: A

	every day. The optimum soil temperature for germination is between 12 and 24°C (55–75°F).	cabbage. →Add more fertilizer when most or all of your cabbage plants should be at least 6 inches tall →Add a nitrogen-heavy, liquid fertilizer (such as 21-0-0) once you determine the plants are ready. Put about 1/2 cup of the fertilizer into the mix for every 10 feet of cabbage row →Add final batch of fertilizer to the garden plot once a noticeable head forms on the cabbage plants, following the same procedure.		highly active, systemic, residual organophosphate insecticide. Tebufenozide: Molt-inducing pesticide used on cabbage

Cotton	Cotton is the most important fibre crop and cotton seed is used as a vegetable oil and a part of fodder for milch cattle for better milk production. Cotton is a Kharif Crop and grows in tropical and subtropical areas. Cotton requires modest rainfall and in India, it is one of the predominant rainfed crops. Cotton requires uniformly high temperature (21°C to 30°C). It grows in areas having at least 210 frost	→Cotton plant consumes Nitrogen (N) at a double quantity compared to Phosphorus (P) and Potassium (K). Consequently, a N-P-K 20-10-10 fertilizer is more suitable, if a soil analysis is impossible. A common fertilization schedule applied by many cotton growers is adding 440 lbs. (200 kg) of N-P-K 20-10-10 per hectare during sowing (through the sowing machine), and 440 lbs. (200 kg) of N-P-K 20-10-10 per hectare during flowering(1 hectare = 10.000 square meters = 2,47 acres)	6.05	Metolachlor: insecticide applied to soil to control weeds T Trifluralin: Insoluble in water but does not leave residues on crops so residues only occur in root tissues. Considered a pre-emergence herbicide Chlorpyrifos: Insecticide effective in controlling cutworms, corn rootworms, cockroaches, grubs, flea beetles, flies, termites, fire ants, and lice.

	free days in a year. Optimum soil for cotton is the Black soils. Also grows well in alluvial soils, red and laterite soils. Cotton growing is known as less mechanized farming in India so needs cheap labour.	→Another common fertilization scheme is adding 550 lbs. (250 kg) of ammonium nitrate, 400 lbs. (181 kg) of N-P-K 0-46-0 and 400 lbs. (181 kg) of N-P-K 0-0-50 per hectare throughout the year. These quantities are normally spread in 8 equal applications, with the first being after sowing and the last around 6 weeks after flowering. →In other cases, farmers prefer foliar applications of KNO_3 once a week after the first flower appears. Foliar applications can provide		Methamidophos: A highly active, systemic, residual organophosphate insecticide. Tebufenozide: Molt-inducing pesticide used on cabbage

		fertilizers and insecticides at the same time, and thus reduce labor costs.		
Grapes	The grape vines can reach lengths in excess of 30 m and can live for many years with proper management. The leaves of the grape vine are alternately arranged on the stem and are long and broad with 5–7 lobes, typically reaching sizes of 5–20 cm (2.0–7.9 in). Flowers are produced in clusters and fruit. Grapes are the most widely produced commercial fruit crop in the world. They are often eaten fresh but are	Grapes planted in most soil types require some fertilizer to grow their best. Excessive soil nutrients, however, cause vines to grow rapidly while fruit production and quality decrease. →Nitrogen: Grapevines require nitrogen when they grow rapidly (January or February). Apply 5 to 10 pounds of poultry or rabbit manure or 5 to 20 pounds of steer or cow manure per	3.55	Boscalid: used on specialty crops Cyprodinil: Used as a foliar fungicide and as a seed dressing on barley. Dicloran: Widely used fungicide used on a variety of ornamentals Methamidophos: A highly active, systemic, residual organophosphate insecticide.

	also commonly used to produce wine. Grapes can also be processed into jams, and preserves, juices, grape seed oil, grape seed extract, raisins and vinegar. vines should be grown in full sun, in a well draining soil and in a location where there is good circulating air to reduce incidence of disease. Grape vines are usually planted as dormant bare root vines in Spring. Fruit clusters can be removed as required throughout the growing season.	vine. You can apply 1/2-pound of ammonium sulfate, 3/8-pound of ammonium nitrate or 1/4-pound of urea per vine when the grapes reach 1/4-inch in diameter. →Zinc: It helps with pollination, hormone production and other essential plant functions. Apply zinc during spring about a week before they bloom or when the vines are in full bloom. Apply it with a concentration of 0.1 pounds per gallon to the foliage of each vine. Alternatively, you can		

		daub fresh pruning cuts with a zinc solution immediately after you prune vines during early winter. →Potassium: If there is potassium deficiency like decreased shoot growth, yellowing and burning during summer, apply potassium fertilizer during the spring when the vines are beginning to produce fruit. Apply 3 pounds of potassium sulfate per vine for a mild deficiency. For a severe potassium deficiency, apply up to 6 pounds per vine.		

Groundnut	Groundnut is most important oil seeds of India. Grown as both as kharif and Rabi crop but 90-95% of the total area is devoted to kharif crop. Groundnut thrives best in the tropical climate and requires 20°C to 30°C temperature. 50-75 cm rainfall is favourable for groundnut cultivation. Groundnut is highly susceptible to frost, drought, continuous rain and stagnant water. It needs dry winder at the time of	Nitrogen plays an important role for good growth and development of groundnut. It meets its nitrogen requirement mostly through fixation of nitrogen in the atmosphere. In early stages of plant growth nitrogen is very much in demand when the plants are in the initial stages of nitrogen fixation. Apply a starter dose of 15 to 20 kg N/ha, and encourage nitrogen fixation by Rhizobia inoculation to meet the nitrogen needs of plants. The starter dose of nitrogen is side dressed along with phosphorus and potassium application just before sowing.	5.5	Chlorpyrifos: Insecticide effective in controlling cutworms, corn rootworms, cockroaches, grubs, flea beetles, flies, termites, fire ants, and lice.

	ripening. Well drained light sandy loams, red, yellow and black soils are well suited for its cultivation. India is the second largest producer of groundnut (After China).	→Lime application is also essential in acid soils. Apply lime @ 0.25 LK or 5 quintals per hectare along with FYM in furrows at the time of sowing. Supplement organic manures with chemical fertilizers @ 20 kg N, 40 kg P2O5 and 40 kg K2O/ha. Apply full dose of fertilizer in the furrow. Seed should not come in contact with fertilizer. Phosphorus should be applied in form of single super phosphate which also meets the Sulphur requirement. Apply well powdered gypsum @ 250 kg/ha close to the base of plants at 20-25 days after sowing on either side and incorporate in the soil, so that it remains in top 3 cm of soil.		

Jute	Jute is the fiber that comes from the stem of two species of jute plants. Jute requires a lot of water and warm temperatures, which is why it is grown in east and northeast India. It is a **Zaid** crop, which means it is grown between the Kharif and Rabi growing seasons. The Ganges river delta produces over 80% of the world's jute. Burlap sacks are made from jute fibers.	→Application of recommended dose of fertilizer (100 % NPK) was sufficient for jute fibre yield while nutrient uptake was significantly higher with 150% NPK but at par only with 100% NPK + 10 tonnes FYM/ha when N and P are considered. →Jute seed production to Nitrogen (N), Phosphorus (P) and Potassium (K) was assessed in different Agro-Ecological Zones (AEZ) with increasing dose of N, P and K fertilizers. Significantly high seed yields were	5.5	Endosulfan: found to be the most effective insecticide for controlling semilooper. Bihar hairy caterpillar and myllocerus weevi

		found with the application of 100-20-20, 75-40-20 and 100-20-20 kg N-P-K/ha at Rangpur (AEZ No. 3b), Manikganj (AEZ No. 8d) and Kishorganj (AEZ No. 8b) respectively.		
Melons	Watermelon, is a vining annual plant. Watermelon originates from Africa. Watermelon is usually consumed as a fresh fruit. Watermelon is a warm-season crop, requiring lots of sun and good drainage to develop optimally and growing best at temperatures between	Use nitrogen based fertilizer at the onset. Once the plant begins flowering, switch to a phosphorus and potassium based fertilizer. Watermelons require ample potassium and phosphorus for optimal melon production. →Apply 5-10-10(N-P-K) at	5.5	Pyraclostrobin: Controls foliar fungal diseases

	18 and 28°C (65–82°F). Watermelon will yield best if grown in a light, well-draining soil, rich in organic matter and with a pH between 6.0 and 7.0. Watermelon should be planted in full sun and heavy feeders. They need to be provided with even soil moisture and fertilized regularly. Vining varieties can grow to very large sizes and require a good deal of space. Watermelon can be direct seeded in areas with a long, warm growing season . If direct seeding,seeds should be sown after the	the rate of 15 pounds per 500 feet. To minimize possible nitrogen burn, mix the fertilizer thoroughly through the top 6 inches of soil. →Amend the soil with 4 inches of well-aged compost mixed into the top 6 inches of soil prior to setting watermelon seeds. →Once the seedlings have emerged, top dress with either 5-5-5- or 10-10-10 general all-purpose fertilizer. Fertilize the watermelon plants in the		

	last frosts and when the soil has warmed to at least 18.4°C (65°F). Watermelon vines are sprawling and require plenty space to grow.	amount of 1 1/2 pounds per 100 square feet. When fertilizing watermelons with granular food, do not let the it come into contact with the leaves as they are sensitive. Water the fertilizer in well so the roots can easily absorb the nutrients. →As soon as the vines begin to run, use a 33-0-0 fertilizer at the rate of ½ pound per 50 feet of the row. Water the fertilizer in well. Fertilize again once the fruit has just emerged.		

		→Side dress the vines prior to running with a 34-0-0 food at the rate of 1 pound per 100 feet of row or calcium nitrate at 2 pound per 100 feet of row. Side dress again once the fruit has just appeared on the vine.		
Maize	It is used both as food and fodder. It is a Kharif crop which requires temperature between 21-25 C and grows well in old alluvial soil. In some states like Bihar it is grown in Rabi season too. Use of	The economic analysis for the past 32 years (1980–2012) including the current experiment showed that N–P–K rates 80–30–25 (at Dogbo), 80–15–40 (at Allada) and 80–30–0 (at Dassa) were the best fertilizer recommendations for maize as they presented	6.05	Azoxystrobin: This chemical does not leach and is unlikely to contaminate water bodies. It is found to exhibit very low ecological risks, to aquatic life, birds, and mammals

	modern inputs such as HYV seeds, fertilizers, irrigation have contributed to its increased production.	the highest grain yields and the best return to investment per hectare. Nevertheless, 80–30–25 is advised for Dassa considering that sustainable maize production will require regular inputs of potassium.		Cyprodinil: Used as a foliar fungicide on maize. Cyfluthrin: Insecticide used to control cabbageworm. It is also used in public health situations and for structural pest control. Methamidophos: A highly active, systemic, residual organophosphate insecticide.
Onion	Onion, is an herbaceous biennial. The bulb is an edible vegetable and is	→Phosphorus acts as a starter solution which invigorates the growth of	4.95	Carbendazim (MBC): Found to be acutely toxic to honeybees,

	the most commonly used part of the onion, usually consumed after cooking although it can be eaten fresh. The stems and leaves are also edible. Onions are hardy, cool season vegetables that grow best at temperatures of 12 to 24 °C (55–75 °F), growing particularly well in areas with cool spring weather and drier, hotter summer weather. They require a fertile, well-draining soil such as clay or silt loams with a pH of 5.5–6.5. The plants do not do well in acidic soils. Onions	young seedlings. Banding phosphorus, such as super phosphate (0-20-0), 2-3 inches below the seed involves making a trench 3 inches deep, distributing one-half cup of super phosphate per 10 row feet, covering the phosphate with soil, sowing seed and covering lightly with one-half inch or less of soil. Once established, onion plants should receive additional amounts of fertilizer (21-0-0 - Ammonium sulfate or Ammonium nitrate) as a side-dress application every		having an effect on long term survival of colonies. Dicloran: Widely used fungicide used on a variety of ornamentals Boscalid: used on specialty crops

	should be set out in full sun for optimum bulb development. Onions are biennial vegetables and if they are left in the ground for a second year, they will produce flowers and set seed. In milder climates, onion seeds can be direct seeded as soon as the soil is workable in the Spring, 4–6 weeks before the last frost date, or even earlier if starting seeds indoors to produce transplants.	month. → Onion crop yielding 300 q/ha removes 73 kg nitrogen, 36 kg phosphorus and 68 kg potassium. Whole quantity of phosphorus, potassium and half of nitrogen should be mixed in the soil before transplanting. Remaining half of nitrogen should be given as topdressing in single dose		
Pepper	Bell peppers, are a cultivar group of annual or perennial plants Bell peppers can be eaten	You should usually not fertilize pepper plants the first few weeks after transplanting them, This	5.5	Carbendazim (MBC): Found to be acutely toxic to honeybees,

	fresh as a salad vegetable, or cooked in a variety of dishes. Bell peppers are warm-season crops and grow best at temperatures between 18 and 30°C (65–86°F). They can be grown in many soil types although sandy soils warm faster in Spring and are good for early planting. The soil should have a pH between 6 and 7. Peppers will not tolerate water saturated soil and should be planted in a well draining soil or raised bed. Peppers should be planted in an area that	may cause an over abundance of green growth and very little fruit production. You can put down fertilizer in your garden or container a couple of weeks before transplanting it →Apply 5-10-10 fertilizer. A lower nitrogen number will help the plant grow, without doing it at the expense of producing fruit. →Most granular fertilizers are applied at a rate of 1 1/2 pounds per 100 square feet. Avoid letting the granules touch the plants, this		having an effect on long term survival of colonies. Pyraclostrobin: Controls foliar fungal diseases Acetamiprid: Contact neonicatinoid insecticide targeting sucking-type insects. Can be applied to soil or as a foliar spray

	receives full sun for most of the day.	may burn the plant. Apply the granular fertilizer in a circle around the plants and water it in well. →If you are using a water soluble fertilizer, try to avoid spraying the fertilizer on tops of the plants. Wet leaves, branches, blossoms and fruit are more likely to develop diseases. It's better to concentrate your efforts at the base of the plant.		
Peas	Pea, is an annual herbaceous legume. The pea plant is an annual plant, surviving	→Because peas are good foragers, they don't need much fertilizer. A day or two before planting,	6.0 It's best to water pea	Fludioxonil: A fungicide used to control fungal disease,

	only one growing season and can reach 30–150 cm in height. Young green seeds and pods can be eaten fresh or cooked as a vegetable. Peas are cool-season crops and should be grown in early Spring or late summer to avoid high summer temperatures. Peas grow best at temperatures between 15 and 24°C (60–75°F) and are tolerant of frost down to -6.5°C (20°F) although they are generally less sensitive to Spring frost. Pea plants will grow best in	broadcast three to four pounds of 5-10-10 commercial fertilizer over each 100 square feet of garden space. Then work it into the top two to three inches of soil. →You may prefer to use organic fertilizers, such as well-rotted or dehydrated manure or bone meal. Spread a one- to two-inch layer over your raised beds and work in the material. If you use local manure, be sure it's well aged. →	plants at least one a week with a deep soak, depending on the rainfall and temperatures in your area. Try not let the soil dry out completely. Very dry soil will negatively affect production.	making it a useful seed treatment as well as a post-harvest treatment Pendimethalin: herbicide found to not be toxic to bees or mammals but highly toxic to aquatic invertebrates and fish.

	soils rich in organic matter with a pH between 5.5 and 7. They should be planted in a well draining soil or raised bed as they do not tolerate too much moisture. Peas perform best in full sunlight although they are also tolerant of partial shade. Cool season crops are often attacked by powdery mildew and where the disease is known to be problematic, resistant varieties should be planted.			
Potatoes	Potato is an herbaceous perennial plant Potato	→Fertilizing potatoes 2 weeks after planting	6.05	Dicloran: Widely used fungicide used on a

	tubers are a staple food source in temperate regions and are eaten after cooking. They may be cut or sliced and made into potato chips or fries. Potatoes can also be processed into starch, alcohol or flour. Potatoes are cool season crops which grow best in cooler climates or as a winter crop in areas with warm summers. They are sensitive to heat but can tolerate a light frost. Potatoes require a deep, fertile, loose, well-draining soil with a pH between 5.8 and 6.5	them in your garden is generally a good idea. It gives them the energy they need to grow large, well developed spuds. Continue to apply fertilizer every 4 weeks. Stop fertilizing 2 weeks before harvest. →Choose an all-purpose granular fertilizer, usually 5-10-10 or 8-24-24. Scatter the granules on the ground around the plants and water them in well. It is generally applied at a rate of 1 1/2 pounds per 100 square feet. Be sure not to allow the fertilizer	Fertilizer needs to be watered in well to work properly. The plants generally require about 1 inch of water a week from rainfall or irrigation. Water-satureated soil should be avoided as it can poorly formed tubers and rot.	variety of ornamentals Metolachlor: insecticide applied to soil to control weeds Pendimethalin: herbicide found to not be toxic to bees or mammals but highly toxic to aquatic invertebrates and fish. Acephate: General use insecticide commonly used to protect from biting and sucking insects. Considered toxic to bees Methamidophos: A highly active, systemic,

	and will grow optimally at daytime temperatures between 18 and 27°C (65–80°F) and night time temperatures between 12 and 18°C (55–65°F).	to come in contact with the plant, as it may burn or have other adverse consequences. → For growing potatoes organically, mix some compost and/or well-rotted manure into the soil before planting. You can also add bone meal, wood ashes and seaweed for additional nutrients during the growing season. In addition, you can use a compost mix when you are mounding soil over the plants.		residual organophosphate insecticide. Acetamiprid: Contact neonicatinoid insecticide targeting sucking-type insects. Can be applied to soil or as a foliar spray
Radishes	Radish is an herbaceous annual or biennial plant. The radish root can be	→Radishes need little in the way of fertilizer added to soil. In fact, a common	4.95	Chlorpyrifos: Insecticide effective in

	eaten fresh in salads or cooked with other ingredients such as meat. The leaves of the plant are also edible and can be used as a salad green. Radishes are fast growing cool-season vegetables that grow very well in cool moist climates. The optimum temperature for the growth of radishes is between 10 and 18°C and they grow best in well-draining sandy loams which are rich in organic matter with a pH between 5.8 and 6.8. Radish should be grown in full sun to part	problem with growing radishes is having too much of certain elements, usually nitrogen for example 5-20-10 will work. → Soil amendments from ingredients at hand can add certain components with lower nitrogen content. Examples are sawdust and straw, both of which require the slow decomposition that keeps active nitrogen levels fairly low.		controlling cutworms, corn rootworms, cockroaches, grubs, flea beetles, flies, termites, fire ants, and lice. Azoxystrobin: This chemical does not leach and is unlikely to contaminate water bodies. It is found to exhibit very low ecological risks, to aquatic life, birds, and mammals.

	shade. Seeds should be planted in late winter to early spring for the first spring crop and plantings can be staggered to provide a continuous harvest.			
Rice	It is a staple food crop for majority of India. It is a Kharif crop which requires high temperature(above 25 C), high humidity with annual rainfall above 100cm. Development of dense network of cannel irrigation and tube wells have made it possible to grow rice in areas of less	→Apply 50, 12, 12 kg/acre of N,P an K respectively. →Apply 1/3 nitrogen, the whole of phosphorus and potassium before the last puddling. Broadcast the remaining nitrogen in two splits, one three weeks after transplanting and the other three weeks afterwards. Phosphorus can be top dressed up to 21 days after	6.45	Azoxystrobin: This chemical does not leach and is unlikely to contaminate water bodies. It is found to exhibit very low ecological risks, to aquatic life, birds, and mammals. Diazinon: In 1994 the EPA phased out the residential use of

	rainfall.	transplanting. Skip phosphorus application to rice if recommended dose of phosphorus had been applied to the preceding wheat crop. If possible, apply the second and the third split doses of nitrogen when water is not standing in the field. Irrigate on the third day of the application of fertilizer. → Urea (110 kg/acre) had the highest nitrogen efficiency and should therefore be the fertilizer of choice for the cultivation of paddy rice in developing countries.		Diazinon and in 1988 cancelled the registration for use on golf courses and sod farms. It is currently used on rice, and some others.

Spinach	Spinach is a leafy herbaceous annual plant. It is eaten cooked as a vegetable and contains both large amounts iron, calcium, and other essential vitamins and minerals. Spinach grows well in cool areas and can survive the first frost of temperate climates. It will germinates and grows optimally at temperatures between 4 and 16°C but can withstand temperatures as low as -7C. Spinach grows best in a well-draining loamy soil with a pH between 6.4 and	→The time to think about fertilizing spinach is before you even plant it. Mixing in a nitrogen-rich fertilizer into the soil before planting will result in much higher yields. Something like 10-10-10 will get the job done. → Then use a water-soluble fertilizer every 2 weeks or so while the plants are growing. We fertilize spinach about every 2-3 weeks during the growing season. → If you want to grow organically, you can side dress with any organic fertilizer that is rich in	4.95 Keeping the soil most is important when growing spinach. Spin ach plants tend to bolt quickly in hot weather. By keeping the soil moist and cool, you can prolong the harvest season, giving you more spinach leaves to pick.	Carbendazim (MBC): Found to be acutely toxic to honeybees, having an effect on long term survival of colonies. Pyraclostrobin: Controls foliar fungal diseases Chlorothalonil: General use insecticide. Found to be non-toxic to honey bees

	6.8. It is sensitive to acidic soil and if the pH is too high, adding lime is recommended. The soil temperature should not exceed 21°C. It is propagated from seed with round seeded spinach usually being sown in early spring for a summer harvest and the prickly seeded type which is usually sown in fall for harvest in winter and spring.	nitrogen. Plant and manure-based composts work well and can be applied once or twice during the growing season. Fish emulsion or well-rotted manure can also be used as soil additives before you plant.		
Soyabean	It is an herbaceous annual plant. It seeds can be used to make flour and dairy substitutes such as milk, margarine and yogurt	→The soybean is a legume and if properly inoculated, can use the nitrogen in the atmosphere (N2) for plant growth. Therefore, nitrogen fertilizer is not needed for	6.05	Metolachlor: insecticide applied to soil to control weeds Pendimethalin: herbicide found to not

	and meat substitutes. Oil can be extracted from both the seeds and pods and the byproduct of the extraction is used as an animal feed. The oil from the plant is used in products such as paint, linoleum and soap. Soybean is also grown as a cover crop and used as animal fodder or hay. Soybean is a short-day plant, requiring hot weather for optimum production. It can be grown year round in most parts of the tropics. Plants can be grown at ambient temperatures between 15 and 27°C	soybean production in most situations. →If NO3--N at a 24-inch depth is less than 75 lb./acre, use of some N (50 to 75 lb./acre) in a fertilizer program may be beneficial. Measure the amount of NO3--N to a depth of 24 inches before applying nitrogen fertilizer. →Soybean seeds are very sensitive to fertilizer placed on or near the seed row, so do not band fertilizer with the seed as a "popup" fertilizer application at planting. →Apply phosphate in the spring before planting. Phosphate fertilizer can		be toxic to bees or mammals but highly toxic to aquatic invertebrates and fish. Trifluralin: Insoluble in water but does not leave residues on crops so residues only occur in root tissues. Considered a pre-emergence herbicide Tebufenozide: Molt-inducing pesticide used on soyabean . Found to be not acutely toxic to honey bees

	although temperature below 21°C and above 32 may reduce flowering. Temperatures more than 40°C are detrimental to seed production. Soybeans are adapted to grow in a wide range of soils and climates but require adequate soil moisture for germination and seedling establishment. Plants are sensitive to waterlogging but are tolerant of drought conditions once established. Soybean grows best on a light, loose, well-draining loam with a pH of 6.5.	produce substantial increases in soybean yields if soil test values for phosphorus are in the low ranges. →Below are the equations for requirement: • Recommended P_2O_5 = [1.752 - (0.0836) (Bray P in ppm)] (Expected yield) • Recommended P_2O_5 = [1.752 - (0.1114) (Olsen P in ppm)] (Expected yield) • Recommended K_2O = [2.0 - (0.0088) (Soil test K in ppm)] (Expected yield)		

Sugarbeat	It is cultivated as a source of sugar. Sugar beet juice contains high levels of sucrose and is second only to sugarcane as the major source of the world's sugar. The sugar beet was also grown as a garden vegetable and for fodder long before. The sugar beet has long been grown as a summer crop in relatively cool parts of the temperate zones of the world. More recently it has been grown as a winter crop in the warm regions of the temperate zones. The growing	→Nitrogen status of the plant affects early growth and the quality of the sugarbeet at harvest. Excess nitrogen at or near the end of the growing season reduces sugarbeet quality by reducing sucrose concentration. We discourage growers from using liquid nitrogen (28-0-0) and ammonium nitrate (33-0-0) in the fall. Split applications of nitrogen may be wise for sugarbeets grown on sandy soils (only). →The sugarbeet plant uses phosphorus for energy compounds. Phosphorus increases root yields in soils that are low in phosphorus	6.05	Acephate: General use insecticide commonly used to protect from biting and sucking insects. Considered toxic to bees Methamidophos: A highly active, systemic, residual organophosphate insecticide. Tebufenozide: Molt-inducing pesticide used on tobacco. Found to be not acutely toxic to honey bees

	period from sowing to harvesting is 170–200 days. Sugar beets are grown from seed and can be sown in various soils ranging from sandy loam to heavy clay.	while not affecting quality. →Do not use a starter fertilizer with potassium. Potash fertilizer can have a negative effect on germination if placed on or too close to the seed. Therefore, broadcast potash applications. →Average intake of sugarbeet is: 80-140, 60-120, 100-170 kg/ha of N, P and K respectively.		
Sunflower	Sunflower is an herbaceous annual plant. Sunflower seeds can be eaten either fresh or cooked or used to extract oil which is widely used in cooking. The seeds are	→Too much fertilizer, especially nitrogen, can result in lush green foliage, but few flowers. Fertilizing lightly and using the right type of fertilizer can give your sunflowers a boost without inhibiting	6.05 Water after fertilizing, so the nutrients can seep into the soil.	Boscalid: used on specialty crops Pyraclostrobin: Controls foliar fungal diseases Trifluralin: Insoluble in water but does not

	commonly harvested for bird seeds. They are often grown as ornamental plants due to their large, attractive flower head. Sunflowers are generally very easy to grow and thrive in areas with long hot summers. They grow best at temperatures between 21 and 25.5°C .Sunflowers can be very large and require plenty of space except some. Sunflowers will grow in a variety of soils as long as they are not waterlogged and can be grown successfully at a pH ranging from 6.0 to	blooming. →Spread a 3-inch layer of compost over the loosened soil to provide some nutrients while also improving moisture and drainage in the planting bed. →Sprinkle a low-nitrogen fertilizer, like 5-10-10 blend, over the bed. One-half cup per 25 square feet is sufficient. →. Sunflowers rarely require further fertilizer during the growing season.		leave residues on crops so residues only occur in root tissues. Considered a pre-emergence herbicide

	7.5. They should be grown in an area that receives full sunlight and it is preferable to provide them with some shelter from wind which can damage the stems.			
Sweet corns	Seet corn is a cereal with high sugar content. The fruit of the sweet corn plant is the corn *kernel. It* is picked when immature (milk stage) and prepared and eaten as a vegetable, rather than a grain. Since the process of maturation involves converting sugar to starch, sweet corn stores poorly and must	→After the seedlings reach 12 inches tall, a 10-10-10 fertilizer can be applied to promote growth. Most granular fertilizers are applied at a rate of 1 1/2 pounds per 100 square feet. Consult the fertilizer package for application instructions. Try to avoid letting the granules touch the plants themselves, as this may	4.5 Drought conditions will result in stunted plants. Because diseases are fairly rare, it's fine to water the tops of the plants as	Metolachlor: insecticide applied to soil to control weeds Pendimethalin: herbicide found to not be toxic to bees or mammals but highly toxic to aquatic invertebrates and fish. Cyfluthrin: Insecticide used to control cutworms, ants,

	be eaten fresh, canned, or frozen, before the kernels become tough and starchy. Corn is used as livestock feed, as human food, as biofuel, and as raw material in industry. Corn is inferior to other cereals in nutritional value. Its protein is of poor quality, and it is deficient in niacin.	burn your plants. Instead, scatter the granules on the outside edges of the rows. Water shortly after applying the fertilizer. Watering corn after applying the fertilizer allows the granules to enter the soil where the roots can absorb it.	well as the roots. It is done best in the early morning hours. That way, the afternoon sun will evaporate any extra water that isn't absorbed into the soil. It will also eliminate water from sitting on the ears of corn, preventing the	silverfish, cockroaches, termites, grain beetles, weevils, mosquitoes, fleas, flies, corn earworms etc Dicloran: Widely used fungicide used on a variety of ornamentals

			development of mildew.	
Sugarcane	It is a tropical as well as subtropical crop. It grows well in hot and humid climate with temperature 21-27 C and an annual rainfall between 75-199cm. Irrigation is required in the regions of less rainfall. It can be grown well in variety of soils and require manual labor from the time of sowing to harvesting. India is second largest producer after Brazil.	→ Nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, zinc, manganese, copper, boron, molybdenum, and chlorine are supplied either from soil minerals and soil organic matter or by organic or inorganic fertilizers. →Nitrogen is required for vegetative growth (tillering, foliage formation, stalk formation and growth) and root growth. →P- requirement is relatively less than N and K. It is necessary for formation of proteins and	6.45	Diazinon: In 1994 the EPA phased out the residential use of Diazinon and in 1988 cancelled the registration for use on golf courses and sod farms. It is currently used on rice, and some others.

		thus for yield build up ans is important for cell division leads to crop growth →Requirement of K is greater than N and P. It is required for carbon assimilation, photo synthesis translocation of carbohydrates. It is develops resistance to sugarcane against pest, disease and lodging. →Apply a 20-2-10 pack of N-P-K.		
Tea	India is the largest producer and consumer of black tea in the world. It grows well in tropical and subtropical climate endowed with deep and	→Tea responds to manuring and it has been estimated that to produce 100kg of made tea, tea plant utilizes on an average 10.2, 3.2 and 5.4kg of Nitrogen, Phosphorus and Potash per	5.5	Tebufenozide: Molt-inducing pesticide used on tea. Found to be not acutely toxic to honey bees

	fertile well drained soil, rich in humus and organic matter. It requires frequent showers all throughout the year. It is a labour intensive industry. It is processed within the tea garden to restore its freshness,	ha. Manuring in tea starts from nursery stage itself. Once they strike roots (after 4 months) 30g of soluble mixtures (Ammonium phosphate (20:20) 35 parts, potassium sulphate and Magnesium sulphate each 15 parts and zinc sulphate and Magnesium sulphate each 15 parts and zinc sulphate – 3 parts) is dissolved in 10 litres of water and is applied with rosecan for about 900 plants. This must be repeated at 15 days intervals.		
Tomato	Tomato is an herbaceous annual. The fruit can be eaten raw or cooked and is used in	→Put down fertilizer in your garden about 2 weeks before transplanting tomato	6.05 Water plants lightly at base	Dicloran: Widely used fungicide used on a variety of ornamentals

	many dishes. The fruit may also be processed into juice, soup, ketchup, puree, paste or powder. Tomatoes grow very well in warm areas at temperatures between 21 and 24°C (69.8–75.2°F). They require a deep, loamy, well-draining soil with a pH between 5.5 and 6.8. If soil drainage is a problem then tomatoes can be planted in a raised bed. Like all fruiting plants, tomatoes require full sun for most of the day. Seeds can be direct seeded in areas with a long	plants. Apply 5-10-5 or 5-10-10 fertilizer. This contains half as much nitrogen as phosphate. A higher phosphate and potassium number will encourage more fruit production. A lower nitrogen number will help the plant grow, without doing it at the expense of producing fruit. →Most granular fertilizers should be applied at a rate of 1 1/2 pounds per 100 square feet. When fertilizing tomatoes with a granular product, make sure to avoid letting it touch the	instead of overhead as wet foliage is more prone to diseases and the buried stem needs time to adapt and sprout roots. It is important that tomato plants receive even watering to prevent the development of blossom end rot, drip or soaker hoses work best and mulching around the	Cyfluthrin: Insecticide used to control cabbageworm. It is also used in public health situations and for structural pest control.

	growing season.	plants. Apply the granules in a circle around the tomato plants. After applying the fertilizer to your garden, water it in well. →If you are using a water soluble fertilizer, try to avoid spraying it on the plants themselves. Instead, concentrate your efforts at the base of the plant. A tomato plant receives nearly all of its nutrients through the root system.	plants helps to conserve soil moisture.	
Tobacco	It is an herbaceous annual or perennial plant Tobacco is a stimulant and the dried	→Nitrogen is a natural element that will promote the rapid growth of your plant, including the root system,	6.05	Dicloran: Widely used fungicide used on a variety of ornamentals

	leaves of the tobacco plant can be cured and used to produces tobacco cigarettes, cigars and snuff or for pesticide production. It grows very well in a wide range of climates and will grow optimally at temperatures between 20 and 30°C in areas where there is a dry period to facilitate harvest of the leaves. The type of soil depends on the variety of tobacco being grown but the best yields are usually obtained in loam to sandy loam soils. The soil should have a pH	stems and foliage. If your plants are looking stunted, apply a good dose of nitrogen →Phosphoric acid as potash will speed the development and processing of the tobacco plant →Calcium nitrate may be used as a complement to phosphoric acid. It helps the absorption of carbon dioxide and the expelling of oxygen. →When using blended materials, producers are encouraged to utilize materials with a low P analysis such as 6-3-18.		Cyfluthrin: Insecticide used to control cabbageworm. It is also used in public health situations and for structural pest control. Methamidophos: A highly active, systemic, residual organophosphate insecticide. Tebufenozide: Molt-inducing pesticide used on tobacco. Found to be not acutely toxic to honey bees

	between 5.0 and 6-6. They are easily damaged by waterlogged soils and quality can be affected by high salinity. Plants should therefore be grown in a well-draining and well aerated soil.			
Wheat	It is the second most important cereal crop. This is a Rabi crop which requires a cool growing season and a bright sunshine at the time of ripening. It requires 50-70cm of annual-rainfall evenly distributed over the growing season. It is	→Two third or half of the quantity should be applied at the time of sowing and remaining one third or half quantity should be top dressed at first irrigation in medium or heavy soils. In calcareous soils and in strongly alkaline soils, 10-30 % of applied nitrogen may be	6.05	Fenbuconazole: Systemic fungicide intended for use as an agricultural and horticultural fungicide spray for the control of leaf spot, yellow and brown rust, powdery mildew and net blotch on wheat

	a winter crop which needs low temperature, ideally between 10-15 C at the time of sowing and 21-26 C at the time of harvesting. Most suitable soils for it are fertile loamy and clayey soil. Plains are most suitable.	lost through ammonia volatilization, if urea or other ammonical fertilizers are used for top dressing. In such cases CAN should be preferred to urea. → For phosphatic and potassic fertilizers, placement below the seed is the best method in the moist soils. Full dose of phosphorus and potash should be applied at the time of sowing. If possible, place P and K 3-5 cm to the side and 3-5 cm below the seed with the help of ferti-seed drill		Pendimethalin: herbicide found to not be toxic to bees or mammals but highly toxic to aquatic invertebrates and fish.