Question	Correct Answer	Answer2	Answer3	Answer4
A conservation buffer is designed to accomplish which of the following goals?	all of these	protect streams and lakes from sediment runoff	protect manmade structures, such as roads or buildings, from potentially adverse effects of weather or human activities such as agriculture and timber harvest	serve as living snow fences and grass hedges
Under the Conservation Reserve Plan (CRP), producers:	all of these	voluntarily retire environmentally sensitive cropland for 10 to 15 years	receive annual rental payments for the Commodity Credit Corporation	Need not eliminate all invasive species to be eligible
Seed that are viable (alive) may fail to germinate when planted. Failure of this seed to germinate may be caused by:	hard seed coat or dormancy	the seed being too old	improper storage of the seed	all of these
Which of the following crop species are primarily cross pollinated?	corn and alfalfa	wheat and soybean	oats and barley	none of these
Application of nitrogen to legume forage crops such as alfalfa and red clover is not recommended since:	with the help of bacteria, these crops can fix atmospheric nitrogen	forage crops do not require nitrogen for growth	application of nitrogen to legumes can result in prussic acid poisoning	Nitrogen is a dangerous chemical and should not be used on potential feed crops
You have a bunker silo that will hold 400 tons of wet corn silage packed at an average density. If you anticipate corn silage yields of 5 tons per acre of dry matter (harvested at 35% dry matter), how many acres of corn will you need to plant in order to fill your bunker silo at harvest? Round your answer to the nearest whole number.	28 acres	35 acres	42 acres	24 acres

Johnsongrass is a serious weed problem in crops such as corn and sugarcane because:	all of these	it perreniates and spreads by rhizomes	it produces a lot of seed	it is resistant to most corn and sugarcane herbicides
Your cousin, who lives in southern Illinois, has a new job selling seed corn. He has four varieties that he thinks you should try. Varieties A and B are 120 day corn, variety C is a 100 day corn and variety D is a 95 day corn. According to his yield trial data, variety A yields more than variety B, but does not dry down as fast. Both A and B yield much more than variety C or D. Variety D out yields variety C. Since you do not trust your cousin, you don't want to buy any seed from him. However, he agrees to give you a free bag of seed to try of one variety, but not of all four. Which variety would you try?	Variety D	Variety A	Variety B	Variety C
Each year, millions of acres of winter wheat in the central Plains of the US are utilized as a dual purpose crop (forage and grain). The wheat is grazed early in the growing season and cattle are subsequently removed. In order to get a grain crop, the livestock must be removed before:	jointing stage	tillering stage	first flag leaf	none of these
The first mechanical seed drill was invented in 1730 by:	Jethro Tull	Cyrus Doolittle	John Deere	Eli Whitney
Your neighbor had a field sprayed about two weeks ago while it was windy. Over the period your lawn and flowers started turning yellow and died. Your shrubs also have some die back. Which of the following herbicide modes of action most likely caused this damage?	Amino acid inhibitor	Growth regulator	Pigment inhibitor	Cell membrane disruptor
Which of the following species is a monocot?	Sorghum	Common ragweed	Soybean	Buckhorn plantain
Legumes can fix nitrogen from the atmosphere. Which of the following is a legume?	White clover	Corn	Sunflower	Canada thistle
Which of the following is considered a secondary nutrient?	Calcium	Nitrogen	Phosphorus	Potassium
Which soil texture tends to have the highest Cation Exchange Capacity range?	Organic soils	Course (sands)	Medium (silts)	Fine (clays)
At which stage does corn require the most water?	Silking	Early tassel	Milk	Prior to 12-leaf stage
Your soil test recommends 190 pounds of nitrogen per acre applied to your 22 acre rice field. How much urea (46-0-0) do you need to apply to meet the recommendation?	4.54 tons	460 pounds	8740 pounds	3 tons
Which of the following pesticide formulations is most damaging to spray equipment?	Wettable powder (WP)	Emulsifiable concentrate (EC)	Flowable (F)	Dry flowables (DF)

What is the most important concept when applying pesticides?	Read and follow the label	Calibrate the sprayer	Use correct PPE	Proper storage
Which of the following is most toxic?	An insecticide with an LD of 700	Grain alcohol with an LD50 of 1200	A fungicide with an LD50 of 12000	A herbicide with an LD of 2300
Generally, which nutrient deficiency causes tissues to turn yellow at a pH above 7.2?	manganese	phosphorus	iron	boron
Which of the following nutrients is most mobile in soil solution?	boron	iron	calcium	phosphorus
Which of the following soil types would have the highest organic matter?	muck	silt loam	sandy clay loam	sand
You are applying Aatrex 4E at a rate of 1 quart per acre using 10 gallons of water per acre of application. You are traveling at 4.5 MPH, the nozzles are 20 inches apart, and your boom length is 90 feet. How much Aatrex and water would you need for an 8 acre field?	2 gallons of Aatrex and 80 gallons of water	80 gallons of Aatrex and 2 gallons of water	8 gallons of Aatrex and 20 gallons of water	1 quart of Aatrex and 10 gallons of water
On what part of the plant does a bollworm feed?	fruit	flowers	foliage	roots
Which of the following groups of essential elements are classified as micronutrients?	Zn, Mn, and Mb	Mn, K, and Ca	P, N, and K	Mg, Ca, and S
Maganese is essential to a crop plant for which of the following reasons?	photosynthesis	activation of enzymes	adjustment of stomatal movement	necessary for normal mitotic divisions
Plants grown on alkaline soils can suffer ill effects from:	Al and Mn deficiency	Mo and Mg toxicity	Al and Mn toxicity	increased nitrification
A pesticide is most likely to move offsite if it has which of the following characteristics?	high volatility	high solubility	strongly absorbed to soil colloids	rapidly degraded by soil organisms
To raise the potassium level of the soil in your field from 130 to 150 you would probably want to spread _____ on your field.	Potash	DAP	Triple super phosphate	Urea ammonium nitrate
A pesticide that can only be handled and applied by a certified applicator is called a _____ use pesticide.	restricted	general	special	licensed
Soil herbicides that exhibit differential selectivity are generally based on what?	differential metabolism	placement	physiological morphogenesis	all of these
You are applying 2,4-D and it is important that you minimize spray drift. Which of the following nozzle types would be the WORST choice to use?	hollow cone	flood jet	flat-fan EVS	flat-fan

A "transgenic" crop is any plant that:	has one or more foreign genes inserted via molecular techniques	has been transported across wide geographic regions	has been backcrossed to a "wild genotype" parent plant	is a cross between two genetically related species
What plant characteristics should NOT be a primary consideration when selecting a cultivar for planting?	seed size	yield performance	disease resistance	maturity group
Farmer Sarah has a half section of dryland wheat in western Kansas. She has her wheat custom harvested and is quoted a cost of $11 per acre plus $0.21 per bushel Sarah expects a yield of 45 bushels per acre. What are her total harvest costs?	$6,544	$3,024	$3,502	$15.95
How many acres are there in a rectangular parcel of land that measures 900 feet long and 620 feet wide?	12.8	9.6	55.8	5.8
Grassy weeds can be identified based on morphological traits such as:	auricles and ligules	plant tissue and analysis	petiole length	none of these
Plant pathogens consist of four main groups. They are:	viruses, fungi, bacteria, and nematodes	fungi, weeds, bacteria, and viruses	insects, weeds, fungi, and bacteria	fungi, insects, bacteria, and viruses
Which of the following diseases are bacteria most likely to cause?	Smuts	Verticilium, Rhizoctonia, or Fusarium stalk rots	Vegetable Soft Rots	Tobacco Mosaic (TMV), Tomato Spotted Wilt (TSWV)
Nematodes are:	tiny little parasitic worms	flagellated fungal hyphae	rod shaped bacteria	viroids
Which of the following would be an advantage of increased organic matter?	all of these are advantages	improves soil tilth	provides a "storehouse" for nutrients	provides surface protection
Generally, which of the following nutrient deficiencies causes interveinal chlorosis?	manganese	nitrogen	potassium	sulfur
Which of the following crops uses the most nitrogen?	soybeans	wheat	potatoes	cotton

Liebig's 1840 "Law of the Minimum" stated that:	the least available nutrient will limit yield	the most available nutrient will limit yield	it was against the law to apply more than a minimum amount of manure on sloping fields	maximum yields could be achieved using minimum fertilizer inputs
Tomato spotted wilt virus (TSWV) affects which of the following crops?	All of these	Tomatoes	Peppers	Peanuts
The fertilizer recommendations that a farmer receives with the soil test results typically vary the most with	crop and yield goal	time of year	method of application	the level of conservation tillage the farmer uses
You are planting 35 acres of pinto beans. You want to plant 60 pounds of viable seed per acre. The seed you purchased is 95% pure with a germination of 93%. How many actual pounds must you plant?	2377 pounds	2211 pounds	1855 pounds	2100 pounds
Which of the following tillage systems and residues would provide the most water infiltration 1 hour after a rain?	no tillage, 80% residue cover	no tillage, bare surface	no tillage, 40% residue cover	plowed, disked, cultivated with a bare surface
How many pound of alfalfa are in a 50 pound bale of alfalfa hay?	50 pounds	it depends on the bale density	it depends on moisture content	it depends on the shape of the bale
Which of the following is a micro-nutrient that would cause the leaves to appear somewhat striped when the pH is high and it becomes deficient?	Zinc	Boron	Calcium	Potassium
Which of the following activities is most apt to result in a long-term soil pH increase?	irrigation with water containing high levels of salt	application of high rates of animal manure	application of fertilizers containing ammonia	acid rain
A corn producer wants to apply a total of 300 pounds of nitrogen per acre on his corn field. He has spread 10 tons per acre of dry manure with an average analysis of 15 pounds of nitrogen per ton. How many additional pound of nitrogen must he apply?	150	120	283	None, he has applied enough already.
Which of the following nutrients is most mobile in the plant?	nitrogen	phosphorus	calcium	magnesium

The loam soil textural group contains many subdivisions. An ideal loam may be defined as:	a mixture of sand, silt, and clay particles that exhibits light and heavy properties in about equal proportions	a mixture of predominantly sand with a little clay	a mixture of mostly sand and clay with a small amount of silt	none of these
Which of the following soil types would require the greatest amount of lime to bring up a low pH condition?	clay loam	sandy clay loam	clay	silt loam
The highest concentration of phosphorus in a plant is usually found in the	seed	stems	leaf	root
Given that the atomic weight of phosphorus is 31 and oxygen is 16, what is the percentage of phosphorus in 100 pounds of P_2O_5?	43.70%	55%	39.10%	20%
The carbon/nitrogen (C/N) ratio in soil is important for at least two reasons. First, competition for available nitrogen results when residues having a high C/N ratio are added to soils. Second, because this ratio is relatively constant in solids, the maintenance of carbon (and hence soil organic matter) is largely dependent on:	soil nitrogen level	soil textural class	cation exchange capacity of soil	soil pH
You are with a non-FFA friend at a local home and garden supply store and you pass through the fertilizer aisle. Your friend notices that all of the bags have three numbers on them, each separated by a hyphen. Your friend also notices a bag that has a very high first number and much lower second and third numbers. You explain to your friend that this designation means that the fertilizer:	has a high nitrogen content and is probably intended for lawn application	has a high phosphorus content and is intended to stimulate root growth	high a high potassium content and is intended to help promote healthy plants	costs a lot more than the rest
You have a rice field that measures 1350 ft. by 1452 ft. Your soil test recommends that you apply 100 pounds of nitrogen per acre to this field. How much urea (46-0-0) do you need to apply to this field to meet the recommendations?	4.89 tons	6.11 tons	1 ton	271.7 pounds

What is nitrification?	the biochemical oxidation of ammonium to nitrate	the conversion of an element from the inorganic to the organic form	the biochemical process whereby ammoniacal nitrogen is released from nitrogen containing organic compounds	the biochemical reduction of nitrate to gaseous nitrogen
Which nutrient must be applied, if deficient, for all grain crops?	all of these	zinc	manganese	boron
When using the Feekes Scale for staging wheat growth, to what does stage 10 refer?	in boot	tillering stage	flowering	second node visible
In corn production, R1 refers to:	silking	tassel emerged	3rd leaf collar fully emerged	emergence
Phosphorus is essential to a crop plant for which of the following reasons?	all of these	structural component of DNA	structural component of RNA	structural component of energy transfer molecules (ATP, ADP)
Hypogeal seedling emergence is characteristic of:	corn and garden peas	most legumes	cotton	none of these
Photosynthesis is the process whereby plants convert solar energy into chemical energy. This process consists of a "dark" reaction and a "light" reaction. The "dark" reaction refers to:	synthesis of glucose from CO_2 and H_2	generation of ATP	cyclic and non-cyclic photophosphorylation	none of these
Vernalization is a common requirement for temperate climate species before reproduction can occur. This term refers to:	cold treatment of a plant or a seed	the requirement for short winter days to induce flowering	a plant's ability to survive cold winter weather	an indeterminate flowering habit
Which of the following plants is a dicotyledonous (2 sets of chromosomes) species in the botanical family *Gramineae*?	corn	alfalfa	cotton	buckhorn plantain
Why do some plants not re-grow after they are cut?	they are annuals and determinant	they are annuals and in-determinant	they are perennials and determinant	they are perennials and indeterminant
Parallel venation in a plant leaf would be characteristic of which of the following plants?	corn	buckwheat	Soybean	all of these
Which of the following plant diseases is caused by a virus?	Barley yellow dwarf	Powdery mildew of red clover	Stewart's Wilt	Blue stem of tobacco

Which of the following diseases are viruses most likely to cause?	Tobacco Mosaic (TMV), Tomato Spotted Wilt (TSWV)	Verticilium, Rhizoctonia, or Fusarium stalk rots	Vegetable Soft Rots	Smuts
Which of the following insects is considered a beneficial or predatory insect?	Lady beetle	aphid	Mexican beet beetle	Japanese beetle
Which of the following factors in seed germination are NOT enzymatically controlled?	Imhibition of water	Absorption of oxygen	Increase in respiration	Initiation of cell division
Over 50% of the world's food supply comes from three crop sources. They are:	corn, rice, and wheat	corn, soybeans, and wheat	rice, potatoes, and wheat	soybeans, corn, and rice
A bushel of corn at 15.5% moisture weighs 56 pounds. How much does a bushel of corn weigh at 19% moisture?	68.6 pounds	61.4 pounds	57.5 pounds	51 pounds
The main purpose of flooding a rice field is to control weeds. However, deep water can negatively impact rice production. How?	All of these	Reduced leaf area	Reduced grain yield	increased plant height but reduced tillering
How is a sugarcane field established?	It is planted using sugarcane stem pieces called brillets	It is seeded with a conventional grain drill	By broadcast seeding	With transplanted seedlings
If the recommended seeding rate for wheat is 13 to 21 seeds per foot within a 7 inch row, what would happen if the rate was increased to 50 seeds per food within a 7 inch row?	disease and lodging would increase	nothing would occur	increased yield would result in better straw	an increase in tiller numbers
How many acres are there in a rectangular parcel of land that measures 800 feet long and 620 feet wide?	11.4	55.8	12.8	9.6
What tools does the USDA use to detect and monitor a new crop disease problem?	all of these	sentinel plots	agent scouting	disease forecast models
Which of these conditions favor the spread of a new disease from South America into the US, such as Soybean Asian Rust?	large tropical storms and hot, humid weather	cool, dry weather in the southeastern US	cold winters in the southern US	all of these
Your broadleaf plants exhibit cupping of the leaves and epinasty. Which of the following herbicide types would most likely cause such injury?	growth regulators	cell membrane disrupters	pigment inhibitor	amino acid inhibitors

You are applying Banvel 4F at a rate of 1/2 pint per acre using 20 gallons of water per acre of application. You are traveling at 4.5 MPH. The nozzles are 20 inches apart. What is the output for each nozzle?	.30 GPM	.20 GPM	.15 GPM	.50 GPM
A pesticide is most likely to pollute groundwater if it has which of the following characteristics?	high solubility	high volatility	strongly absorbed to soil colloids	rapidly degraded by soil organisms
Looking at an Atrazine 4F label, what does the F stand for?	flowable	fine mixed	first added	strength rating
You are applying Prowl 3.3EC at a rate of 2 pints per acre using 20 gallons of water per acre of application. You are traveling at 4.5 MPH. The field size is 1000 feet by 1089 feet. The nozzles are 20 inches apart. How much herbicide and water will you need to treat the field?	6.25 gallons of Prowl and 500 gallons of water	50 gallons of Prowl and 500 gallons of water	10 gallons of Prowl and 200 gallons of water	500 gallons of Prowl and 20 gallons of water
A Colorado producer has a center pivot sprinkler irrigating 200 acres of pinto beans. To control weeds, he will chemigate 4.2 ounces of herbicide per acre on his field. How many gallons of herbicide must he use to do this application?	6.5	4.2	47	840
Conservation programs, such as CRP (Conservation Reserve Program) and EQIP (Environmental Quality Incentives Program) are administered by which of the following governmental agencies?	National Resource Conservation Service (NRCS)	Homeland Security	Environmental Protection Agency (EPA)	Conservation and Environmental Quality Agency
USDA defines "Highly Erodible Land" (HEL) as land having an erodibility index (EI) of 8 or more. This EI is a ratio of the inherent erodibility of a soil to the soil loss tolerance. The soil loss tolerance, or "T" value, is:	an estimate of the rate of soil erosion that can occur on a given soil without significant long-term productivity loss	the tons (T) of soil lost per year if the land was continuously clean tilled	an estimate of the total soil lost due to water erosion only	all of these
Generally, which nutrient deficiency causes tissues to turn purple?	phosphorus	iron	nitrogen	sulfur
Which of the following groups of essential elements are classified as primary?	P, N, and K	N, K, and Ca	Mg, Ca, and S	N, P, and S

A local farmer wants to apply a total of 200 pounds of nitrogen per acre on his corn field. He has spread 9 tons per acre of dry manure with an average analysis of 10 pounds of nitrogen per ton. How many additional pounds of nitrogen must he apply?	110	100	283	None, he has applied enough already.
The smallest particle in soil is:	clay	silt	sand	loam
Which of the following would be a disadvantage for applying manure to a field?	potential nitrogen runoff	increased organic matter	added soil nutrients	all are advantages
Fertilizers are chemical compounds. The ratio of elements in a particular fertilizer (chemical) can be easily calculated by knowing the weight of the individual components. Given that the atomic weight of potassium is 39.1 (and you have two of these!) and oxygen is 16, what is the percentage of potassium in 200 pounds of K_2O?	83%	50%	45%	39.10%
A soil is classified as "acidic" if the pH is:	below 6.5	higher than 7.5	neutral	has no pH
The primary source of error from a soil test is:	field sampling technique	laboratory analysis	soil that is too wet	none of these
A fertilizer is being advertised as an all purpose 13-13-13. What does the 13-13-13 indicate?	13% nitrogen, 13% phosphorus, 13% potassium	very, very, very bad luck	13% urea, 13% P_2O_5, 13% K_2O	None of these
Giberellins used as a plant growth regulator	intensify enzyme production and stimulate cell growth	induce shoot cells and are used to thin fruit	prolong storage	induce stem shortening
What part of a plant cell contains non-nuclear DNA?	mitochondria	nucleus	chloroplasts	cell wall
In soybean growth staging, which of the following refers to full bloom?	R2	R8	VC	V4
As a rice, wheat, or other grain crop plant emerges through the soil surface, the primary leaf or plumate is protected by the:	hypocotyls	rhizome	coleoptiles	mesocotyl
The vascular tissue in a crop plant that conducts nutrients is the:	phloem	xylem	parenchyma	hypocomida
Peanut plants grow:	with pods forming at the end of pegs below ground	with pods forming from flowers above the ground	with nodules forming on the roots that become nuts	with pods in the axils of branches and petioles

Which of the following is a warm season (C4) grass?	bermudagrass	orchardgrass	Kentucky bluegrass	Tall fescue
Why do some forage plants not re-grow after they are cut?	They are annuals	They are determinant	They are in-determinant	All of these
The leaf blade of a grass plant is attached to a leaf sheath, which in turn attaches to the stem of the plant at the:	node	ligules	auricles	stemmata
Phototropism is caused by plant hormones that cause a plant to:	lean toward a light source	have downward growth of roots	have upward growth of stems	all of these
An example of a biological pesticide is:	bacillus thuringensis	an organophosphate	a carbonate	a pyrethroid
What are two insecticides that can inhibit the important enzyme cholinesterase, resulting in rapid twitching and paralysis?	organophosphates and carbonates	chlorinated hydrocarbons and organophosphates	carbonates and chlorinated hydrocarbons	none of these
Always read the label of a pesticide at least:	4 times	2 times	1 time	3 times
The proper mixing order for pesticides is:	wettable powders - dispersible granules - emulsifiable concentrates - surfactants	surfactants - liquid fertilizers - wettable powders - dispersible granules	surfactants - liquid fertilizers	emulsifiable concentrates - dispersible granules - wettable powders - surfactants
The weeds in your field are turning white. Which of the following herbicide types would most likely cause such injury?	Pigment inhibitor	Growth regulator	Cell membrane disrupter	Amino acid inhibitors
Which of the following statements appears in some form on every pesticide label?	Keep out of reach of children	Danger	Avoid eye contact	Do not inhale dust
If you wanted to make a banded herbicide application that would apply an equal amount of herbicide over the banded area, you would use what type of nozzle?	flat-fan EVS	hollow cone	flood jet	flat-fan
The large phylum Arthropoda includes:	insects and arachnids	snakes and lizards	fungus and mold	mammals and birds
Sclerotinia is:	a fungus	a virus	a bacteria	an insect
Pink bollworms damage cotton by:	all of these	damaging bolls	feeding on flowers	feeding on squares

Which of the following soybean disorders is caused by a microscopic pathogenic roundworm?	Soybean cyst nematode	phytophthora root rot	sclerotinia mold	charcoal rot
Which of the following insects is necessary for pollinating cucumbers, squash, watermelon, and cantaloupe?	None of these	Lady Beetle	Japanese Beetle	Grasshopper
Which of the following insects is best describes as a beetle with copper colored wings and a jade green head?	Japanese Beetle	Armyworm	Bean Leaf Beetle	Lady Beetle
Which of the following weeds contains compounds (alkaloids) that are toxic to animals?	jimson weed	redroot pigweed	common lambsquarter	onion
Which of the following pathogens would cause a mottled or mosaic effect in leaf tissue?	virus	fungi	bacteria	nematode
Earliest planting date for a crop species is determined by:	soil temperature	crop variety	calendar date	soil moisture
What is the main purpose for flooding rice during production?	weed control	improves soil aeration	increased nitrogen uptake	none of these
A friend wants to plant his 125 acre corn field with a population of 32,000 plants per acre. The seed he will purchase has 80,000 kernels per bag. The germination rate is 99%. How many bags of seed does he need to purchase?	51 bags	48 bags	94 bags	120 bags
An accurate estimate of a plant population per acre can be obtained by counting the number of plants in a length of row equal to one-thousandth (1/1000) of an acre. How many feet equals one one-thousandth of an acre based on 30 inch row spacing?	17 feet 5 inches	18 feet 2 inches	16 feet 4 inches	20 feet
Which of the following is the highest acceptable moisture content for long term storage of corn for grain?	15.50%	20.20%	18.80%	12.30%
You are purchasing hay and have a choice between two lots of alfalfa hay that are equal in quality and both are selling for $150 a ton. There is only one difference: lot A is 10% moisture and lot B is 15% moisture. What is the actual price per ton of dry matter for each lot of hay? Round to the nearest dollar.	A = $167 and B = $176	A = $140 and B = $135	A = $135 and B = $128	There is no difference

You have planted 100 acres of winter wheat, and you realize that the price of cattle is pretty good and the price of wheat is uncertain. So, you decide to contract graze some stocker cattle on your wheat. You can graze their cattle for approximately 42 days from about mid-February until April 1st (you need to remove the cattle by the first hollow stem since you want to retain the option of a grain harvest). You estimate that you can safely remove 1500 lbs/acre of forage (on a dry basis) over the 42 day period (about 35 lbs per acre per day). Animals are expected to gain 2 lbs per day. Average animal forage intake is 3% of body weight per day (dry forage). How many 500 lb steers should you contract?	200	105	1111	233
You have planted your corn along the river in a field that is very heavy clay. Right after planting, you received a heavy rain and the soil crusted badly. You are worried about your corn being able to emerge through the hard crust. What can you do about this situation?	borrow your neighbor's rotary hoe (and use it on this field)	nothing, just pray for more rain to soften the ground	cultivate between the row to break up as much ground as possible	replant as soon as possible
Generally, which nutrient deficiency causes grass leaves to have yellow margins?	potassium	phosphorus	iron	sulfur
Which of the following groups of essential elements are classified as secondary?	Mg, Ca, and S	N, K, and Ca	P, N, and K	N, P, and S
A local farmer wants to apply a total of 190 pounds of nitrogen per acre on his rice field. He has spread 8 tons per acre of dry manure with an average analysis of 10 pounds of nitrogen per ton. How many additional pounds of nitrogen must he apply?	110	100	283	None, he has applied enough already.
The largest particle in soil is:	sand	silt	clay	loam
A limitation of a no-till cropping system is:	certain crop disorders may be more of a problem	increases in fuel costs	increases in machinery purchases	more labor required
A soil is classified as "alkaline" if it has a pH	higher than 7.5	below 6.45	that is neutral	has no pH
The forms of nitrogen available for plant use are:	nitrates and ammonium	nitrates and nitrites	ammonium and nitrites	all of these
A soils cation exchange capacity or CEC is determined by its organic matter content and the amount of:	clay	sand	silt	water
Vernalization is a process some plants require to flower and produce seed. This process involves exposure to:	cold temperatures	hot temperatures	over 12 hours of sunlight	under 12 hours of sunlight

Sweet corn hybrid XYZ is ready for picking at 82 days in Fairfield, Michigan, but it takes 102 days for the same sweet corn to be ready in Fairfield, Washington. The *best* explanation for this is difference in:	degree days	sub-soil structure	elevation	soil texture
In corn production, VT refers to:	tassel emergence	emergence	3rd leaf collar fully emerged	silking
Geotropism is caused by plant hormones that cause a plant to:	both of these	have downward growth of roots	have upward growth of stems	none of these
Which of the following crops is a dicot?	tomato	corn	rice	orchardgrass
In small grain production (rice, wheat, rye, barley, or oats), jointing refers to which of the following?	the first node is visible (Feekes stage 6)	tiller production (Feekes stage 3)	the grain is in boot (Feekes stage 10)	the flag leaf has emerged (Feekes stage 9)
What role does Nitrogen play in a plant?	Used for synthesis of proteins	Primary component of cellulose	Part of the lignin in a plant	Primary compound of sugars
Which of the following crops uses the most nitrogen?	Soybeans	Cotton	Corn	Orchardgrass
Drought has a severe impact on yield of most grain crops during:	flowering, reproductive stages	mature seed grain stage	cotyledon stage	rooting stage
Why would you add a surfactant to a pesticide for application?	all of these	to enhance absorption of the pesticide	to aid in spreading and sticking of the pesticide	to enhance the pesticide's rain-fastness
The broadleaf weeds in your sorghum field are showing cupped leaves and epinasty. Which of the following herbicide types would most likely cause such injury?	growth regulators	cell membrane disrupters	pigment inhibitor	amino acid inhibitors
The selectivity of a herbicide if a measure of the:	species of weeds it will kill or control	time it will remain active in the soil	toxicity to humans	herbicide's ability not to go off target (i.e., no drift)
Which of the following measures can be used to prevent herbicide resistance from developing in your crops?	all of these	crop rotation	rotating herbicide families	using integrated pest management, including cultivation

You are applying Banvel 4EC at a rate of 2 pints per acre using 20 gallons of water per acre of application. You are traveling at 5.0 MPH. The field size is 1500 ft. x 1089 ft. The nozzles are 30 inches apart. How much herbicide and water will you need to treat the field?	9.3 gallons of Banvel and 750 gallons of water	4 gallons of Banvel and 700 gallons of water	15 gallons of Banvel and 500 gallons of water	500 gallons of Banvel and 20 gallons of water
The reason for adding liquid fertilizer solution to pesticide applications is to:	All of these	Optimize the pesticide's activity	Aid in the penetration and absorption of the pesticide	Aid in the translocation of the pesticide to the active site
Which of the following is a common class of herbicides used at very low rates (less than 1 oz/acre) in cereal crops?	Sulfonylurea (SU) "amino acid inhibitor"	Triazines "photosynthetic"	Growth Regulators	Cell membrane disruptor
Foliar applied herbicides that exhibit differential selectivity are generally based upon what?	differential metabolism	differential placement	physiolofical morphogenesis	all of these
Which of the following diseases contain certain compounds (alkaloids) that are toxic to animals?	ergot	corn smut	powdery mildew of red clover	spring black stem of alfalfa
Stewarts wilt (*Pantoea stewartii)* on sweet corn is caused by a(n):	bacteria	insect	virus	fungus
Powdery mildew can be controlled by using which of the following types of crop protection product(s)?	fungicide	nematicide	miticide	all of these
Which of the following insects is considered a beneficial or predatory insect?	Green Lacewing	Aphid	Mexican bean beetle	Pink Bollworm
With a systemic insecticide the insect may be killed by:	Both of these	ingesting a portion of the plant	contact with the insecticide from spraying the field	none of these
The grain that you had stored is full of holes. Which of the following insects most likely caused this damage?	sawtooth grain beetle	honey bees	lady beetle	corn earworm
Which of the following insects is best describes as a yellow beetle with black stripes and a black triangle directly behind the head?	bean leaf beetle	armyworm	lady beetle	Japanese beetle
Which of the following insects serves as a vector for Stewart's wilt on sweet corn?	flea beetle	seed corn beetle	lady beetle	armyworm
Which of the following pathogens would cause a streaming or water-soaked effect in leaf tissue?	bacteria	fungi	virus	nematode
Which of the following insects has a gel-like body?	aphid	spidermite	Bean Leaf Beetle	green lacewing

Green manuring is a process of:	growing a crop and plowing it under before planting the next crop	adding manure as post emergence treatment to plants	adding manure to plants while they are young	growing a crop to trap insects
You are planting a field of pinto beans 1000' x 697'. The seed you purchase is 98% pure and has a germination rate of 94%. You want to plant 60 pounds of viable seed per acre. How many actual *bags* of seed should you buy? The seed comes in 50 pound bags.	21	20	19	18
An agrichemical has been spilled on the same site year after year and has ended up in ground waster. This situation would be termed:	a point source contamination problem	a super fund site	a non-point contamination problem	a mass flow problem
You are spraying a field at 6 MPH. Your nozzle output is 0.45 GPM. The nozzles are 35 inches apart. How much spray mixture do you need per acre?	12.7 gallons.	8.2 gallons	5.6 gallons	2.0 gallons
You are estimating the plant population for your peanut field. In 17 feet 5 inches you counted 25 plants. What is your average plant population per acre?	25,000	17,500	1,205	250,000
You have a center pivot irrigating 148 acres of tomatoes. To control weeds, you will chemigate 4.5 ounces of herbicide per acre on this field. How many gallons of herbicide must you use for this application?	5.2 gallons	5 gallons	4.5 gallons	3.8 gallons
You have a half section of dryland wheat in western Kansas. You have your wheat custom harvested and are quoted a cost of $15 per acre plus $0.25 per bushel. You expect yield of 48 bushels per acre. What are your harvest costs per acre?	$27	$50	$48	$15
If a soil test indicates that your field is low in phosphorus and potassium, the fertilizer recommendation might suggest that you:	use more fertilizer than crop removal to build the soil test in the low test areas	fallow the field for a year to allow more nutrients to mineralize	apply sufficient N, P, and K to meet the crop removal needs of the field only	apply only liquid fertilizers that may have higher availability
You are deciding on nitrogen fertilizer for your 128 acre sorghum field. The soil test recommendation is for 195 pounds of nitrogen per acre. Which of the following options is most economical? You have all the needed equipment for application.	anhydrous ammonia (82-0-0) at $425 per ton	urea (46-0-0) at $275 per ton	ammonium nitrate (33-0-0) at $250 per ton	28% liquid nitrogen (2.99 pounds N per gallon) at $0.87 per gallon

Prolonged applications of animal manure or biosolids can result in a build up of which of these nutrients?	phosphorus	nitrogen	potassium	sulfur
Mary Hill owns a wheat farm in Kansas. The soil tests show she needs to apply 45 lbs. of nitrogen per acre to meet her crop goals. She has decided to apply anhydrous ammonia which contains approximately 82% nitrogen to her half section (320 acres) which will be in crop. If anhydrous ammonia costs $0.62 per pound, what will it cost her to fertilize? (Round to two decimal points.)	$10,888.00	$27.90	$34.02	$8,928.00
Your rice plant has yellow lower leaves. The newer leaves appear greed. The immediate leaves show yellowing from the tip down to the midvein. Which nutrient deficiency likely caused this damage?	nitrogen	boron	sulfur	phosphorus
Which of the following crops consumes the most nitrogen, whether as commercial fertilizer or biologically fixed nitrogen?	Alfalfa	Corn	Potatoes	Cotton
Which of the following soil components has the largest surface area per cubic foot of soil?	clay	sand	silt	metals
Which of the following soil types would have the highest Cation Exchange Capacity?	Muck	Silt loam	Sandy clay loam	Sand
Which of the following is not a micronutrient needed for plant growth?	Iodine	Boron	Zinc	Maganese
The endosperm is _____ to an emerging seed.	The starchy food source	The first root	Protection for the plumule	The embryo
In corn production, VE refers to:	Emergence	3rd leaf collar	Silking	Tassel emergence
The first true leaves of a soybean plant are:	Unifoliate	Cotyledons	Trifoliate	Parallel veined
Which of the following species has a spiked inflorescence?	Timothy	Kentucky bluegrass	Tomato	Oats
Which of the following weed species is a biennial?	Wild carrot	Pigweed	Canada thistle	Johnsongrass
In small grain production (rice, wheat, rye, barley, or oats), which of the following leaves is most important to grain fill?	The flag leaf	Leaves produces while tillering	All leaves are equally important	None of these
What role does phosphorus play in a plant?	It is used for energy storage and transfer	It is a primary component of cellulose	It is part of the lignin in a plant	It is a primary compound in sugars
On a grass plant, which part is a clasp-like structure located where the blade attaches to the stem?	Auricle	Ligule	Apical meristem	Root

Which of the following structures would be considered an underground stem?	Rhizome	Seed	Auricle	Nodule
Certain genetic lines of corn, soybeans, and cotton have been genetically modified to be tolerant to what commonly used herbicide?	Roundup	2,4-D	Atrazine	Poast
The broadleaf weeds in your corn field are showing a white coloration. Which of the following herbicide types would most likely cause such injury?	Pigment inhibitor	Growth regulator	Cell membrane disrupter	Amino acid inhibitors
The movement of pesticides downward through the soil to the water table is called:	Leaching	Drift	Runoff	Back-siphoning
One of the best ways to avoid herbicide resistance from occurring is to:	Use herbicides with different modes of action to control weeds	Continue to use the same herbicide, just at higher rates	Let weeds that have escaped go to seed	Rotate to a different crop, but use the same herbicide
Looking at the Accent 4DF label, what does the DF stand for?	Dry flowable	Dispersible flowable	Dissolved formulation	Dissolved floride
Paraquat is a contact herbicide extensively used in many cropping systems. This material is not effective against perennial weeds such as _____.	Canada thistle	Common lambsquarter	Eastern black nightshade	Redroot pigweed
You are doing a banding application of a pesticide. Your band width is 12 inches. Your nozzles are 35 inches apart. Your speed is 4.5 MPH. You are using 12 gallons per acre. What is your nozzle output?	0.11 GPM	0.38 GPM	0.32 GPM	0.25 GPM
Barley yellow dwarf is caused by:	Virus	Bacteria	Fungi	Pollution
Your oat crop has a black growth where the seed should be. This blows in the wind. This disease is probably caused by:	Fungi	Bacteria	Virus	Herbicide
Johnsongrass is a serious weed problem in most states due to its spread by both seed and rhizome. Which of these methods would best control this weed?	Fall applied herbicides	Plowing	Cultivation	Spring applied herbicides
Wheat flour that came from storage has small black insects in it. Which of the following insects is most likely to be the problem?	sawtooth grain beetle	Colorado potato beetle	Alfalfa weevil	Flea beetle
This disease spreads by water splash and causes problems with water uptake in the plant as it grows in the vascular tissue. The cause is most likely a:	bacteria	fungi	virus	fungicide damage
Which of the following weeds would most likely be controlled by a lipid synthesis inhibitor herbicide such as Poast?	Annual grasses	Simple perennial broadleaves	Annual broadleaves	Creeping perennial broadleaves

Of the beetles listed, which is the smallest?	flea beetle	lady beetle	Colorado potato beetle	Japanese beetle
Mushrooms are:	fungi	bacteria	viruses	mycoplasm
Environmental concerns require farmers to recognize the danger of excessive nitrogen (N) application rates. What form of applied commercial N or form of N resulting from soil organisms altering applied N and manure is most subject to leaching loss from soil?	Nitrate nitrogen	Urea forms of N	Organic N forms (proteins, amino acids, amines, etc)	Ammonium nitrogen
You are planting a field of red kidney beans 1000' x 697'. The seed you purchase is 99% pure and has a germination rate of 92%. You want to plant 60 pounds of viable seed (PLS) per acre. How many actual *bags* of seed should you buy? The seed comes in 50 pound bags.	22	20	19	18
You are spraying a field at 7 MPH. Your nozzle output is 0.32 GPM. The nozzles are 32 inches apart. How much spray mixture do you need per acre?	8.5 gallons/acre	5.6 gallons/acre	12.7 gallons/acre	2.0 gallons/acre
The PSNT (Pre-sidedress nitrogen test) is used when corn is at what stage of growth to estimate the soil's potential for mineralizing N from organic sources in the soil?	When the corn is about 12 to 14 inches tall and about to enter its rapid growth phase	When the corn is beginning to tassel	When the corn is in the rapid growth stage	When the corn has just emerged from the soil and is at the 1 or 2 leaf stage
Mass flow uptake of nutrients is increased by all but which of the following factors?	Cloudy, cool weather	High winds combined with low relative humidity	High available soil water levels	High intensity sunlight
The water pH of a soil is an accurate measure of what?	The concentration of hydrogen ions in the soil solution	The lime requirement of a soil	The amount of soluble salts in a soil	The amount of free lime in the soil
In **certified organic operations,** which of the following fertilizers can be used on acid soils and still provide P for crop uptake?	Rock phosphate	Raw manure	Ammonium polyphosphates (DAP and MAP)	Triple superphosphates

By cutting alfalfa too late in the fall, the farmer will:	Weaken the stand next spring or reduce yields next spring	Increase the carbohydrate reserves stored in the crown	Destroy the alfalfa weevil wintering over	Increase yield for next year
Over repeated applications biosolids and animal manures can cause a buildup of _____ in the soil.	phosphorus	Radium	nitrogen	Boron
Steve Miller owns a vegetable farm in California. The soil tests show he needs to apply 120 lbs. of nitrogen per acre to meet his yield goal for sweet corn. He has decided to apply urea which contains approximately 46% nitrogen to his half section (320 acres) which will be in crop. If urea costs $.39 per pound, what will it cost him for fertilizer? (round to two decimal points)	$32,556.52	$14,976.00	$6,888.96	$12,208.69
Your cucumber crop is showing chlorosis starting with the leaf margins of the older leaves. Which of the following nutrients most likely is deficient?	Potassium	Nitrogen	Chromium	Manganese
Which of the following is not a primary nutrient for plant growth?	Calcium	Nitrogen	Phosphorus	Potassium
A soil is classified as “acid” if it has a pH	Below 6.5	Higher than 7.5	That has a pH of 7.0	Has no pH
Your soil has a pH of 7.5. You need to lower it to 7.0. What can you do?	Apply sulfur	Apply lime	Apply micronutrients	Apply herbicides
Which of the following components of soil would have the least surface area per cubic foot?	Sand	Clay	Silt	Metals
Which of the following nutrients is considered a micronutrient needed for plant growth?	Zinc	Nitrogen	potassium	Calcium
Which of the following is not a liming material?	Potassium nitrate	Ag ground limestone	Calcium carbonate	Ag pulverized slag
Which of the following crops would require the most phosphorus during the growing season?	Alfalfa – 6 dry tons per acre	Corn –grain (120 bu/Acre)	Sorghum – grain (90 bu/acre)	Wheat – grain + straw (70 bu/acre + 2 dry tons/acre)
In corn production, VT refers to:	Tasseling	Emergence	1st leaf collar	Black layer
Which of the following species is a simple perennial?	Dandelion	Soybean	Wild carrot	Wheat
The first true leaves on a soybean plant are _____.	Unifoliate	Compound	Alternate	Cotyledons
A soybean plant has the top of the plant eaten by a ground hog. The plant recovers and continues to grow. What part of the plant makes this possible?	Axillary buds	Auricles	Large stomates	Rhizomes

What role does Nitrogen play in a plant?	It is a major component of chlorophyll.	It is a primary compound in sugars.	It is a part of lignin in the plant.	It is a primary component in cellulose.
In small grain production (rice, wheat, rye, barley or oats), which of the following leaves is most important to grain fill?	The flag leaf	All leaves are equally important	Leaves produced while tillering	None of the answers listed
Which of the following has a spiked inflorescence?	Rye	alfalfa	Kentucky bluegrass	Rice
On a grass plant which part is a membranous or hairy structure located where the blade attaches to the stem?	Ligule	Apical meristem	Auricle	Root
In small grain production jointing occurs at _____.	Feekes stage 6	Feekes stage 2	Feekes stage 11	None of the answers listed
The part of the seed that becomes the first root is called the _____.	Radicle	Plumule	Endosperm	Hilum
Which of the following statements appears on all pesticide labels?	Keep out of reach of children.	Calibrate sprayer before application.	Danger – poison.	Caution – May be harmful if swallowed.
All of the weeds in the field are turning yellow (chlorotic) about ten days after application. Which of the following herbicide types most likely caused these symptoms?	amino acid inhibitor	Pigment inhibitor	Growth regulator	Cell membrane disrupter
Contact cell membrane disrupter herbicides like Gramoxone Extra are used for harvest aids and weed control in many cropping systems. Which of the following weeds would most likely not be controlled by these herbicides?	Curly dock	Redroot pigweed	Yellow foxtail	Common lambsquaters
When looking at a label for Banvel 4F, what does the F stand for?	Flowable	Dry flowable	Wettable powder	Bait
Which of the following is the best way to avoid herbicide resistance?	Rotate crops using different herbicide families.	Plant the same crop and use the same herbicide at a higher rate.	Plant the same crop and combine different herbicide families.	Rotate crops using Roundup-Ready technology.
The movement of pesticides through air currents from the application site is called _____.	Drift	Leaching	Runoff	Back-siphoning
You are doing an application of Balance Pro prior to planting your corn crop. Your nozzles are 36 inches apart. Your speed is 5.0 MPH. You are applying 15 gallons of spray per acre. What is your nozzle output?	0.45 GPM	0.50 GPM	0.36 GPM	0.15 GPM

A thick, waxy plant cuticle:	increases the amount of herbicide needed	decreases the amount of herbicide needed	has no affect on the rate of herbicide needed	requires a double rate of herbicide
Rainfall or irrigation is needed after a preemergence herbicide application to:	move the herbicide into the weed germination zone	decrease the rate of microbial activity	decrease the rate of herbicide breakdown	improve the distribution of the pesticide sticker used
Certain genetic lines of corn, soybeans and cotton have been genetically modified to be tolerant to what commonly used herbicide:	Liberty	Atrazine	Cobra	Accent
Ergot, a disease of cereal grains, may have been responsible for the Salem Witch Trials. It forms black sclerotia that overwinter. This is caused by what agent?	Fungi	Virus	Bacteria	Herbicide
Canada thistle is a problem weed that spreads by creeping roots. Which of these methods would best control this weed?	Fall applied herbicides	Plowing	Cultivation	Spring applied fungicides
Which of the following insects is considered beneficial or predatory?	Green lacewing	Bean leaf beetle	Colorado potato beetle	Aphid
Your tobacco leaves look mottled and twisted. Nothing has been sprayed in the area. What is the most likely cause listed?	Virus	Bacteria	Fungi	Japanese beetle feeding
Why would you add a surfactant to a pesticide for application?	All of the answers listed	To enhance absorption of the pesticide	To enhance the pesticides rain-fastness to the plant surface	To aid in the spreading and sticking of the pesticide
With a systemic insecticide the insect may be killed by:	Ingesting a portion of the plant; Contact with the insecticide from spraying the field	Wintering over in crop residue that was sprayed with insecticide	Ingesting a portion of the plant	Contact with the insecticide from spraying the field
Stewarts wilt (Pantoea stewartii) on sweet corn is caused by a:	A bacteria	An insect	A virus	A fungus
Which of the following pathogens would cause a streaming or water-soaked effect in leaf tissue?	bacteria	Nematode	Fungi	Virus

What are two insecticides that can inhibit the important enzyme cholinesterase, resulting in rapid twitching and paralysis?	Organophosphates and carbamates	Chlorinated hydrocarbons and organophosphates	Carbamates and chlorinated hydrocarbons	None of the answers listed
Johnsongrass is a serious weed problem in crops such as corn and sugarcane because	All of the answers listed	It perreniates and spreads by rhizomes	It produces a lot of seed	It is resistant to most corn and sugarcane herbicides
What tools does the USDA use to detect and monitor a new crop disease problem such as Asian soybean rust?	All of the answers listed	sentinel plots	agent scouting	disease forecast models
Your tomatoes are planted in 30 inch rows. In 17 ft. 5 in. of row length you count 21 plants. What is your estimated plant population per acre?	21,000	25,400	16,000	17,500
Earliest planting date for a crop species is determined by . . .	soil temperature	soil moisture	calendar date	crop variety
A friend wants to plant his 55 acre lettuce field with a population of 26,000 plants per acre. The recommended seeding rate for the selected variety is 7 pounds per acre. The germination rate is 98%. How many pounds of seed does he need to plant to cover the field?	392.9 pounds	385 pounds	625.8 pounds	8.4 pounds
If the recommended seeding rate for oats is 13 to 21 seeds per foot within a 7 inch row, what would happen if the rate was increased to 58 seeds per foot within a 7 inch row?	Disease and lodging would increase	An increase in tiller numbers	Increased yield and better straw	Nothing would happen
An agrichemical has been spilled on the same site year after year and has ended up in ground water. This situation would be termed:	A point source contamination problem	A mass flow problem	A non-point contamination problem	A superfund site
You are planting a field of pinto beans 1200’ X 797’. The seed you purchase is 98% pure and has a germination rate of 94%. You want to plant 60 pounds of viable seed per acre. How many actual bags of seed should you buy? The seed comes in 50 pound bags.	29	31	19	18
Green manuring is a process of:	Growing a crop and plowing it under before planting the next crop	Adding manure as postemergence treatment to plants	Adding manure to plants while they are young	Growing a crop to trap insects

Depth of fertility soil sampling should:	Reflect depth of tillage and crop characteristics	Be several feet	Stay in the top two inches of soil	Vary with the amount of fertilizer used
Mg, magnesium, is an important element that may have to be added to soils to prevent which of the following conditions in ruminant animals?	Grass tetany	White muscle	Distemper	Black Leg
A biennial weed will live for _____.	2 years	1 year	3 years	more than 3 years
The major casual agent of plant disease is _____.	fungi	nematodes	bacteria	viruses

A nematode is a type of _____.	roundworm	fungus	annual plant	insect
A type of regulatory control is _____.	plant quarantine	soil tillage	sanitation	crop rotation
The control practice that relies on the introduction of parasites and predators is _____.	biological	cultural	chemical	host resistance

A threshold level is also known as the _____.	pest concentration	pesticide residues	control program	degree of pest control
A pesticide used to control diseases is a/an _____.	fungicide	acaricide	nematacide	insecticide
An example of an inorganic pesticide is _____.	Bordeaux mixture	pyrethrum	rotenone	organophosphate
The total amount of pesticides used annually in the United States is _____.	1 billion pounds	820 million pounds	420 million pounds	620 million pounds

A preemergence herbicide is applied _____.	before the weed or crop is present	after the weed or crop is present	at the time of planting	none of the answers listed
Which herbicide family inhibits photosynthesis?	triazines	acetanilines	dinitroanilines	phenoxys
An example of botanical insecticide is _____.	rotenone	2, 4-D	sulfur	diazinon

Pesticide registration often takes	between 8 and 10 years	between 1 and 2 years	between 3 and 4 years	15 years
Pesticide risk can be decreased by _____.	all of the answers listed	proper pesticide exposure	reading the label	minimizing pesticide exposure
The signal word(s) for a highly toxic pesticide is _____.	DANGER-POISON	CAUTION	WARNING	

An example of protective clothing or gear that will minimize inhalation of a pesticide is _____.	a respirator	coveralls	boots	gloves
The number of lethal pesticide poisoning cases per year is _____.	more than 100	less than 20	between 20 and 30	between 40 and 60
The primary function of the root is to _____.	anchor the plant and supply water and nutrients	make sure that the plant will grow	hold up the stem of the plant and provide propagation material	ensure that the plant can be propagated

The portion of the root that takes in the water and plant nutrients is the _____.	root hair	root cap	area of root division	area of cell maturation
The major types of root systems are _____.	fibrous and taproot	area of cell division and fibrous	fibrous and root cap	cuttings and root hairs
The area of cell division is _____.	responsible for the production of new cells on the tip of the root	where the roots drop off on special plants such as the dodder	where the cells will start to specialize	located in the area where the root hairs start to erupt from the wall of the epidermal cell

The phloem _____.	carries the manufactured food from the leaves to the roots	is the pipeline that carries the water and nutrients from the soil to the leaves	is the part of the stem that gives support to the node	is the part of the leaf that holds it to the stem
Herbaceous stems _____.	are green and are not winter hardy	are tough and have bark around them	come from herbs	are part of the bulb
The node _____.	is the part of the stem where the leaf is attached	is the part of the stem that supports the flower	will become detached when dry weather sets in	is the part of the stem that carries the nutrients

The study of functions and the complex chemical processes that allow plants to grow is known as _____.	plant physiology	plant taxonomy	photosynthesis	plant nutrition
Chlorophyll is important in plants because it _____.	is also known as the chloroplasts	creates an atmosphere where it can determine the osmotic pressure	allows the plant to make good xylem tissue	makes it possible for plants to grow
The rate at which photosynthesis is carried out depends on _____.	the light intensity, temperature, and concentration of carbon dioxide	the amount of fertilizer in the water	the amount of oxygen in the atmosphere	the amount of respiration carried on during the daylight hours

Photosynthesis will work best in which temperature range?	65 to 85 degrees F	50 to 60 degrees F	60 to 70 degrees F	85 to 95 degrees F
Respiration _____.	uses food for plant energy	uses carbon dioxide	stores energy	occurs in cells that contain chlorophyll
Plant nutrition is _____.	use of basic chemical elements in the plant	plant food added to the plant pot	the measurement of acidity (sourness) and alkalinity (sweetness)	chemical processes providing plants with elements for growth
Moderate and frequent irrigation would normally be most appropriate for a corn crop growing in a	light-textured soil, such as a loamy sand	region of low humidity	region of high humidity	dispersed alluvial fan soil

Nitrogen deficiency is first detected in the older leaves because	nitrogen is a mobile element	nitrogen is an immobile element	nitrogen is so important to plant growth	nitrogen is affected by compaction of the soil
Soil sampling should not be conducted	if the soil is frozen	if rain is expected	if tillage is going to be done	if the soil is too warm
Band applications of phosphorus (P) and potassium (K):	concentrate nutrients for rapid growth	often harm seed	should always be used	always result in the highest yield
A nutrient has greater potential to move into groundwater on a soil with:	high sand content, such as a sandy soil	high clay content, such as a clay loam soil	high silt content, such as a silty clay loam soil	high organic matter content, such as a muck soil
Phosphorus will not move a great deal in soil because:	it is an anion and reacts with calcium, iron, aluminum and clay surfaces	it is always applied at low rates	it is a cation and reacts with organic matter	it is a cation and reacts with sand
Soil pH is a measure of:	acidity or alkalinity in soil	amount of water found in soil	acidity in soil	alkalinity in soil
Depth of fertility soil sampling should:	reflect depth of tillage	vary according to the amount and type of fertilizer	be at least three feet	stay in the top two inches of the soil
Potassium is held in soil:	by binding to electrical charges on/in minerals and clays	by binding to cobalt	by binding to soil microbes	by binding to the soil solution
Which of the following should be considered when crediting nitrogen from animal waste?	the type of animal producing the waste	the temperature of the waste	cost of hauling the waste	particle size of the waste material

Which of the following crops would use the most nitrogen during the growing season?	alfalfa – 6 dry tons per acre	wheat – grain + straw (70 bu/acre + 2 dry tons/acre)	corn –grain (120 bu/Acre)	sorghum – grain (90 bu/acre)
Which of the following stages of wheat growth comes first in the development of a wheat plant?	tiller stage	first node appears	flag leaf stage	soft dough
Which of the following species is a biennial?	Wild carrot	common dandelion	soybean	johnsongrass
If a V2 sweet corn plant has the top eaten by a deer, how does it continue to grow?	growing point was below ground	it does not grow back.	rhizomes	axillary buds
What role do rhizobia bacteria play in white clover plant development?	fix nitrogen from the air and make it available to the plant.	loosen soil to allow for better root development.	provide more axillary buds.	prevent worms from feeding on roots.
What role does nitrogen play in a plant?	it is a major component of chlorophyll.	it is a primary compound in sugars.	it is a primary component in cellulose.	it is a part of lignin in the plant.
Which of the following has a panicle inflorescence?	Kentucky bluegrass	rye	morning-glory	alfalfa
On a grass plant which part is the clasping part that holds the leaf to the stem?	auricle	root	ligule	apical meristem
In corn production at which growth stage does the plant need the most water?	VT	VE	V5	all stages need the same amount of water

The part of the seed that is food for the embryo is called the	endosperm	hilum	radicle	plumule
Your tomato plants are twisting toward the ground and dying. Which of these type of herbicides most likely caused this damage?	growth regulator	pigment inhibitor	amino acid inhibitor	cell membrane disrupter
When looking at the Counter 5G label, for what does the G stand?	granular	bait	dry flowable	flowable
You are doing an application of Balance Pro prior to planting your corn crop. Your nozzles are 40 inches apart. Your speed is 5.0 MPH. You are applying 10 gallons of spray per acre. What is your nozzle output?	0.34 GPM	0.15 GPM	0.45 GPM	0.50 GPM
A herbicide application made before the crop or weeds emerges is:	a preemergence application	a post-banded application	an off-label application	a postemergence application
Rainfall is needed after a preemergence application to:	move the herbicide into the weed germination zone	decrease the rate of chemical hydrolysis	decrease the chance of herbicide movement into ground water	decrease the rate of microbial activity
Certain genetic lines of corn and soybeans have been genetically modified to be tolerant to what commonly used herbicide:	Roundup	Callisto	Dual II Magnum	Banvel
The reason for adding liquid fertilizer solution to pesticide applications is to:	All of the answers listed	optimize the pesticide's activity	aid in the penetration and absorption of the pesticide	aid in the translocation of the pesticide to the active site
You are doing a banding application of a pesticide to your onions. Your band width is 12 inches. Your nozzles are 34 inches apart. Your speed is 5.0 MPH. You are using 10 gallons per acre. What is your nozzle output?	0.10 GPM	0.38 GPM	0.15 GPM	0.25 GPM

Weeds such as nightshade are hard to control in crops like tomato because:	they are in the same family.	tomato closes canopy quickly.	nightshade grows faster.	they are herbicide resistant.
Corn mushroom (smut) is considered a delicacy in some cultures. What causes this disease?	fungi	virus	bacteria	herbicide
Johnsongrass is a problem weed that spreads by rhizomes. Which of these methods would best control this weed?	fall applied herbicides	plowing	cultivation	spring applied fungicides
Which of the following weeds contains alkaloids that can cause hallucinations or death if ingested?	jimsonweed	wild carrot	pigweed	dandelion
Barley yellow dwarf is caused by	virus	bacteria	fungi	pollution
Which of the following insects is naturally pollinates crops such as cucumber, watermelon, and cantaloupe?	honey bee	corn earworm	grasshopper	gypsy moth
Wheat flour that came from storage has small black insects in it. Which of the following insect is most likely to be the problem?	saw-toothed grain beetle	alfalfa weevil	flea beetle	Colorado potato beetle
This disease spreads by water splash and causes problems with water uptake in the plant as it grows in the vascular tissue. The cause is most likely a	bacteria	fungi	virus	nematode
Which of the following insects has a gel-like body?	aphid	spidermite	bean leaf beetle	Colorado potato beetle
Which of the following insects serves as a vector for Stewart's wilt on sweet corn?	flea beetle	armyworm	seed corn beetle	lady beetle

You are called by your neighbor to look at his cucumbers. The foliage is covered with white spots. With close inspection the spots appear powdery. Which of the following most likely caused the problem?	powdery mildew	herbicide damage (pigment inhibitor)	white grubs	bacterial wilt
Weeds are a problem year after year because:	the seed can be dormant in the soil	weeds are resistant to most herbicides	weeds can grow in all soil temperatures	weeds can grow in any soil pH
A recognizable compaction layer in a field is often called:	a plow pan	a drill pan	a cultivation pan	cleachy material
Jessie is fertilizing her horse pasture with a 12' spreader She has marked the tire on the spreader and has found that by turning the tire one revolution she travels 5'. Next she borrows a pan from the fertilizer dealer and attaches it to the spreader to measure the amount of fertilizer dropped by the spreader. She pulls the spreader with her tractor so the tire on the spreader turns a total of 6 revolutions. She then weighs the fertilizer. ¾ pound of fertilizer was collected. At this rate how much is she applying per acre to her pasture?	90.75 lbs.	181.5 lbs.	22.5 lbs.	30 lbs.
A friend wants to plant his 45 acre lettuce field with a population of 28,000 plants per acre. The recommended seeding rate for the selected variety is 7.5 pounds per acre. The germination rate is 97.8%. How many pounds of seed does he need to plant to cover the field?	345 pounds	625.8 pounds	338 pounds	385 pounds
A systemic fungicide	moves throughout the plant	only moves in the roots of the plant	only moves in the plant stem	does not move in the plant
Which of the following is a way to prevent pesticide resistance?	rotate pesticides with different moves of action	discourage natural predators	use pesticides with a single site of action	use the same pesticide on the same pest year after year
Your soil test recommends 85 pounds of nitrogen per acre applied to your 75 acre canola oilseed crop. How much 36-0-0 do you need to apply per acre to meet the recommendation?	236 lbs.	200 lbs.	20,708 lbs.	36 lbs.

Cropping systems can modify soil structure by:	All of the answers listed	increasing root activity	protecting the soil from erosion	adding organic matter
Most soil compaction results from:	driving on or tilling wet ground	driving on or tilling dry ground	excessive freezing and thawing	use of too many fertilizers and chemicals
Reduced root growth and poor water and nutrient uptake may indicate:	soil compaction	high water table	warm soil temperatures	poor soil tilth
Structure	the make up of soil particles; usually viewed as a percent	the uppermost layer of soil suitable for plant growth	another name for soil aggregates	the largest soil particle that absorbs very little water or nutrient
A horizon	top soil	bedrock	pH value of 7	not active

Nitrogen fixation	process of converting nitrogen gas into nitrogen usable by plants	spraying fertilizer directly onto plant leaves	special compounds containing nitrogen and oxygen	spreading evenly over the entire surface
Parent material	Material from which a soil is formed, determines composition and properties of the soil	places fertilizers about 2 in. to one side of and slightly below the seed	a chemical used for water absorption and adding aeration to soil	the solid layer of rock beneath the soil
Horizon	a specific layer or stratum of soil or subsoil in a vertical cross section of land	the uppermost layer of soil suitable for plant growth	the solid layer of rock beneath the soil	a specific material that supports plant life

Inert	not active	sub-soil	bedrock	top soil
Glacial deposits	sediment and rocks deposited from a glacier	broken down or disintegrated by rot	soil deposited around lakes	weathered rock components in soil
Sphagnum	any of various pale or ashy mosses of the genus Sphagnum whose decomposed remains form peat	proportions of nitrogen (N), phosphorus (P) and potassium (K)	done by placing fertilizer in bands about 8 in. from the row of growing crops	soils form in place without first being moved by wind or water

Bogs	an area of waterlogged soil that tends to be peaty; fed mainly by precipitation; low productivity; some bogs are acidic	a chemical used for water absorption and adding aeration to soil	the smallest soil particle that is plastic when moist but hard when dried	the largest soil particle that absorbs very little water or nutrient
Active ingredients	components that achieve one or more purposes of a fertilizer mixture	using sand, gravel or marbles to support plant roots	all materials that can support plant life	spreading evenly over the entire surface
Water-logged	soaked with moisture	coarse-textured soil	not active	organic material

Bedrock	the solid layer of rock beneath the soil	weathered rock components in soil	pH values above 7 (sweet soil)	pH values below 7 (sour soil)
Soil amendment	a change or addition to soil	mixing fertilizer into soil	coarse-textured soil	top soil
Petiole	young stem and leaves	soil deposited around lakes	organic material	not active

Clay	the smallest soil particle that is plastic when moist but hard when dried	the second smallest soil particle that is slick on your fingers when wet and powdery when dried	the largest soil particle that absorbs very little water or nutrient	all materials that can support plant life
Complete fertilizer	contains all primary plant nutrients (N,P,K)	weathered rock components in soil	mixing fertilizer into soil	a change or addition to soil
Colluvial deposits	type of gravity deposit - materials fall and move down steep slopes by gravitational forces. Unsorted materials contain angular rock fragments with source rock in close proximity	a specific material that supports plant life	the downward movement of water through soil and rock due to gravity	done by placing fertilizer in bands about 8 in. from the row of growing crops

Microbes	a microorganism	top soil	bedrock	sub-soil
Mineral matter	weathered rock components in soil	pH values above 7 (sweet soil)	coarse-textured soil	fine-textured soil
Lacustrine deposits	soil deposited around lakes	fine-textured soil	young stem and leaves	coarse-textured soil

Clayey soil	fine-textured soil	top soil	sub-soil	coarse-textured soil
Loamy soil	medium-textured soil; contain equal parts of sand, silt and clay	sediment and rocks deposited from a glacier	special compounds containing nitrogen and oxygen	all materials that can support plant life
Hydroponics	a technique of growing plants (without soil) in water containing dissolved nutrients	soils form in place without first being moved by wind or water	growing plants with roots immersed in water containing dissolved nutrients	growing plants with a nutrient solution constantly flowing over plant roots

Media	all materials that can support plant life	a microorganism	a specific material that supports plant life	another name for soil aggregates
Foliar spray	spraying fertilizer directly onto plant leaves	spreading evenly over the entire surface	mixing fertilizer into soil	soil composed mainly of decaying leaves
pH	measure of how acidic or basic a solution is, ranging in a scale from 0 to 14	broken down or disintegrated by rot	growing plants with a nutrient solution constantly flowing over plant roots	process of converting nitrogen gas into nitrogen usable by plants

Aeroponics	growing plants with roots suspended in air while being misted regularly with a nutrient solution	soils form in place without first being moved by wind or water	growing plants with roots immersed in water containing dissolved nutrients	a technique of growing plants (without soil) in water containing dissolved nutrients
Aggregate culture	using sand, gravel or marbles to support plant roots	all materials that can support plant life	a specific material that supports plant life	soils deposited by streams or rivers
Alluvial deposits	soils deposited by streams or rivers	soaked with moisture	young stem and leaves	soil composed mainly of decaying leaves

Loess deposits	windblown deposits of fine-grained sediments	soils deposited by streams or rivers	soil composed mainly of decaying leaves	soil deposited around lakes
Permeable	penetrable; porous; allowing liquids or gas to pass through	a change or addition to soil	broken down or disintegrated by rot	nitrogen (N), phosphorus (P), potassium (K)
Profile	a vertical section of the Earth's crust showing the different horizons or layers	special compounds containing nitrogen and oxygen	soils form in place without first being moved by wind or water	a chemical used for water absorption and adding aeration to soil

Crumbs	another name for soil aggregates	young stem and leaves	a change or addition to soil	a microorganism
Water culture, solution culture, or nuticulture	growing plants with roots immersed in water containing dissolved nutrients	growing plants with a nutrient solution constantly flowing over plant roots	a technique a growing plants (without soil) in water containing dissolved nutrients	special compounds containing nitrogen and oxygen
Medium	a specific material that supports plant life	organic material	weathered rock components in soil	soil deposited around lakes

Silt	the second smallest soil particle that is slick on your fingers when wet and powdery when dried	diluted mixture of fertilizer used when plants are transplanted	the smallest soil particle that is plastic when moist but hard when dried	the make up of soil particles; usually viewed as a percent
Subsoil	a layer of soil beneath the topsoil that has lower organic content and higher concentrations of fine mineral particles; often contains soluble compounds and clay particles carried down by percolating water	the largest soil particle that absorbs very little water or nutrient	the make up of soil particles; usually viewed as a percent	the uppermost layer of soil suitable for plant growth

Topsoil	the uppermost layer of soil suitable for plant growth	using sand, gravel or marbles to support plant roots	the solid layer of rock beneath the soil	a specific material that supports plant life
Fertilizer grade	proportions of nitrogen (N), phosphorus (P) and potassium (K)	sediment and rocks deposited from a glacier	nitrogen (N), phosphorus (P) and potassium (K)	soils deposited by streams or rivers
B horizon	sub-soil	top soil	bedrock	pH value of 7

Percolation	the downward movement of water through soil and rock due to gravity	the uppermost layer of soil suitable for plant growth	the solid layer of rock beneath the soil	another name for soil aggregates
Decomposed	broken down or disintegrated by rot	young stem and leaves	soaked with moisture	soil deposited around lakes
Vermiculite	a chemical used for water absorption and adding aeration to soil	mixing fertilizer into soil	a change or addition to soil	the solid layer of rock beneath the soil

Incorporating fertilizer	mixing fertilizer into soil	organic material	a change or addition to soil	fine-textured soil
Neutral	pH value of &	top soil	bedrock	sub-soil
Leaf mold	soil composed mainly of decaying leaves	young stem and leaves	another name for soil aggregates	soil deposited around lakes

Starter solution	diluted mixture of fertilizer used when plants are transplanted	spraying fertilizer directly onto plant leaves	mixing fertilizer into soil	all materials that can support plant life
Perlite	sponge rock, water absorption, coarse, drainage, can only hold its weight by volume	places fertilizers about 2 in. to one side of and slightly below the seed	soils form in place without first being moved by wind or water	a chemical used for water absorption and adding aeration to soil
Band application of fertilizers	places fertilizers about 2 in. to one side of and slightly below the seed	spraying fertilizer directly onto plant leaves	done by placing fertilizer in bands about 8 in. from the row of growing crops	mixing fertilizer into soil

Broadcasting	spreading evenly over the entire surface	soaked with moisture	mixing fertilizer into soil	a change or addition to soil
Acidity	pH values below 7 (sour soil)	pH value of 7	pH values above 7 (sweet soil)	coarse-textured soil
Gypsum	soil amendment used to reduce the alkalinity of soils	mixing fertilizer into soil	soil composed mainly of decaying leaves	a change or addition to soil

Continuous-flow hydroponic systems	growing plants with a nutrient solution constantly flowing over plant roots	spraying fertilizer directly onto plant leaves	soils form in place without first being moved by wind or water	growing plants with roots immersed in water containing dissolved nutrients
O horizon	organic material	not active	top soil	sub-soil
Tillable	(of farmland) capable of being farmed productively	soil composed mainly of decaying leaves	sediment and rocks deposited from a glacier	soils deposited by streams or rivers

Sandy soil	coarse-textured soil	top soil	sub-soil	soaked with moisture
Nitrates	special compounds containing nitrogen and oxygen	a change or addition to soil	young stem and leaves	soil deposited around lakes
Alkalinity	pH values above 7 (sweet soil)	pH values below & (sour soil)	pH value of 7	coarse-textured soil

Primary plant nutrients	nitrogen (N), phosphorus (P), potassium (K)	another name for soil aggregates	broken down or disintegrated by rot	weathered rock components in soil
Peat moss	a blackish-brown material that forms when mosses become compressed into layers over time	a chemical used for water absorption and adding aeration to soil	the smallest soil particle that is plastic when moist but hard when dried	a specific material that supports plant life
C horizon	bedrock	top soil	sub-soil	not active

Side-dressing	done by placing fertilizer in bands about 8 in. from the row of growing crops	places fertilizers about 2 in. to one side of and slightly below the seed	spraying fertilizer directly onto plant leaves	procedure where fertilizer is broadcast lightly over close-growing plants
Sand	the largest soil particle that absorbs very little water or nutrient	soils deposited by streams or rivers	the uppermost layer of soil suitable for plant growth	the make up of soil particles; usually viewed as a percent
Residual soils	soils form in place without first being moved by wind or water	soils deposited by streams or rivers	soil composed mainly of decaying leaves	(of farmland) capable of being farmed productively

Knife application	applying fertilizer in the form of gas (i.e. anhydrous ammonia) into the soil using knives	places fertilizers about 2 in. to one side of and slightly below the seed	spraying fertilizer directly onto plant leaves	done by placing fertilizer in bands about 8 in. from the row of growing crops
Leached	remove soluble parts by running water over or through a substance	broken down or disintegrated by rot	the solid layer of rock beneath the soil	spreading evenly over the entire surface
Top dressing	procedure where fertilizer is broadcast lightly over close-growing plants	the uppermost layer of soil suitable for plant growth	spraying fertilizer directly onto plant leaves	diluted mixture of fertilizer used when plants are transplanted

Compost	a mixture of various decaying organic substances, as dead leaves or manure, used for fertilizing soil	measure of how acidic or basic a solution is, ranging in a scale from 0 to 14	diluted mixture of fertilizer used when plants are transplanted	any of various pale or ashy mosses of the genus Sphagnum whose decomposed remains form peat
Barnyard grass	no ligule, head rolled into the grass at base	widest leaf of cereal grains, large clasping auricles, no hair	trifoliate leaves (three)-small notches on the very tip of the leaf	look at the folded bud like on orchard grass
Buckhorn Plantain	parallel veins and long narrow leaves growing in a whole arrangement close to the ground	no ligule, head rolled into the grass at base	trifoliate leaves (three)-small notches on the very tip of the leaf	widest leaf of cereal grains, large clasping auricles, no hair

Alfalfa	trifoliate leaves (three)-small notches on the very tip of the leaf	widest leaf of cereal grains, large clasping auricles, no hair	look at the folded bud like on orchard grass	no ligule, head rolled into the grass at base
Blue Grass	look at the folded bud like on orchard grass	no ligule, head rolled into the grass at base	widest leaf of cereal grains, large clasping auricles, no hair	trifoliate leaves (three)-small notches on the very tip of the leaf
Barley	widest leaf of cereal grains, large clasping auricles, no hair	look at the folded bud like on orchard grass	trifoliate leaves (three)-small notches on the very tip of the leaf	no ligule, head rolled into the grass at base
Nitrogen fixation in soybean occurs in specialized root structures called	nodules	cotyledons	hypocotyls	meristems

Growth staging in soybeans are divided into vegetative and reproductive stages. The R1 stage is defined as	beginning bloom: one open flower at any node on the main stem	first node: fully developed leaves at unifoliate node	emergence: cotyledons above the soil surface	full maturity: 95% of pods have reached their mature pod color
The stage of growth of soybeans known as V3 indicates	three internodes have leaves	three pods at each node	three seeds per pod	three trifoliate leaves
High night temperatures during seed fill may decrease soybean yield by increasing	respiration	translocation	absorption	photosynthesis
Soybeans do not need the nutrient _____ if they have been properly inoculated	nitrogen	phosphorus	potassium	Calcium
Very early mechanical weed control in an early emerged soybean crop may be accomplished by the use of a	rotary hoe	field cultivator	moldboard plow	disk
You delivered 30,000 pounds of soybeans to the grain elevator at the price of $13.00 per bushel. How much money should you receive?	$6,500	$7,800	$2,308	$3,900
Post-emergence herbicides are applied	after the crop and weeds are up	after the weeds are up, but before the crop comes up	to the soil before planting the crop	to the soil before the crop comes up

A farmer has counted an average of 83 beans in 10 square feet after harvesting soybeans. If an acre contains 43,560 square feet and 3,000 seeds per pound what is his harvest loss in bushels per acre?	2.0	8.8	14.5	0.3
The suggested winter storage temperature for grains and oilseeds in the Upper Midwest is	20-30 degrees F	50-60 degrees F	40-50 degrees F	30-40 degrees F
The maximum moisture content at which soybeans can be marketed without discount for moisture is	13%	11%	9%	15.50%
The hilum of the soybean seed is	the part of the seed attached to the pod and is usually black, brown or yellow in color	a thin covering that protects the seed's embryo from insects, disease and damage	the part of the plant that grows. The stem forms and grows from this point.	the main (primary) root of the seedling. It takes up water and nutrients from the soil to nourish the seedling.
An optimum population per acre for high combine harvested yield of soybeans is	150,000	28,000	75,000	87,000
If soybean plant populations are low, soybeans will compensate for much of the low density by	branching	budding	stooling	tillering
Edible seeds of legumes such as soybeans are called	pulses	stamens	achenes	cereals

The active ingredient in the herbicide used on most soybean acreage is	Glyphosate	Liberty Link	Roundup	2,4-D
The oil and protein in soybean seed is typically in the ratio of	1:2 oil to protein	2:1 oil to protein	3:1 oil to protein	1:1 oil to protein
Under favorable conditions of moisture and soil structure soybeans should be planted how deep?	2 inches	3 inches	4-5 inches	1 inch
Which one of the following is effective at reducing soybean aphid damage?	insecticide sprays	seed inoculants	selection of resistant varieties	crop rotation
Which of the following is the best description of iron chlorosis symptoms?	interveinal chlorosis on the trifoliate leaves	interveinal chlorosis on the unifoliate leaves	irregular dark green streaking on the trifoliate leaves	irregular dark green streaking on the unifoliate leaves
Cool season grassy weeds, such as wild oats can best be controlled by non-chemical methods through	delayed planting	early planting	increased seeding rate	cultivation
Barley normally forms tillers which are	additional seed-producing stems	additional roots	more than one spike from the same stem	needle-like projections attached to the lemma
The recommended seeding rate of barley per acre is about	85 pounds	135 pounds	10 pounds	45 pounds

Barley harvest can make you itch because of its rachilla hairs. The rachilla is attached to the	seed	stems	awns	leaves
Some barley varieties can be differentiated based on their aleurone color of blue or white. The aleurone layer is part of the	seed	stems	awns	leaves
Barley belongs to a group of crop plants known as	cereals	oil seed crops	dicots	pulses
The threshed caryopsis (grain) of barley is covered by	lemma and palea	awns	ligules	auricles
The structure that protects the first leaf of barley as it emerges through the soil during germination is the	coleoptile	epicotyl	hypocotyls	mesocotyl
Barley has a root system described as	fibrous	seminal	tap	branched
Farmers must be careful not to over fertilize barley with _____ because it will increase lodging and grain protein content which are both undesirable	nitrogen	iron	sulfur	phosphorus
The species most difficult to control in a growing crop of barley	annual grass weeds	perennial broadleaf weeds	annual broadleaf weeds	volunteer corn

At the "boot" stage of development the plant is near	heading	maturity	soft dough	tillering
Barley is usually planted in a row spacing of	6-7 inches	20-22 inches	30 inches	40 inches
Malting barley must have low values of the following	vomitoxin	grain plumpness	seed size	test weight
The normal planting depth of barley in inches is	1.5	2.5	3.5	0.75
Barley is a self-pollinated crop; consequently seed saved from the crop will be genetically _____ to the variety planted	identical	intermediate between the two parents	segregating for various plant traits	different
Maximum moisture content for safe storage of barley grain is	13.0	15.5	20.5	9.5
In the field, barley grain is considered physiologically mature when	upper internode supporting the head has lost all green color	upper leaves are beginning to turn yellow to brown	all leaves have fallen off the plant	entire plant is brown
One of the major diseases of barley is	Fusarium head blight	cyst nematode	white mold	phytophthora root rot

Seed treatment before planting is effective for the control of which barley disease	loose smut	stem rust	barley yellow dwarf virus	leaf blight
After taking a soil test, the final decision on the amount of fertilizer to apply for barley will be determined by	All of the answers listed	crop use	previous crop	yield goal
One of the key concepts of integrated pest management in crop production is	wait until a problem exceeds the economic threshold before any treatment action is taken	apply an appropriate pesticide before the problem gets bad	randomly sample for a problem and apply a pesticide to all problems identified	randomly sample for a problem and determine the extent of the problem
The two morphological types of barley are	two-rowed and six-rowed	four-rowed and six-rowed	double stack and triple stack	two-rowed and four-rowed
The two main end-use classifications of barley are	feed and malting	feed and biofuel	feed and sugar	feed and fiber
Adventitious roots are:	specialized roots that grow from uncommon places, such as stems and leaves	area of the root where plant cells reproduce	surface layer on the lower and upper side of the leaf	one main root that grows deep into the soil

Cuticle	top-most layer of the leaf, waxy protective covering of the leaf	reproductive part of the plant	tissue of the leaf where photosynthesis occurs	part of the pistil that receives the pollen
Stamen	male part of the flower that contains the pollen, anther and filament	part of the pistil that receives the pollen	female part of the flower consisting of the stigma, style, ovary and ovules	portion of the male part that contains and manufactures the pollen
Root cap	thimble-shaped mass of cells covering and protecting the growing tip of a root	top-most layer of the leaf, waxy protective covering of the leaf	tiny hair like extensions that increase the surface area of the root	stems that are tender and non-winter hardy

Internode	a segment of a stem between two nodes	a single leaf arising from a plant stem	a bud at the tip of a stem that will produce flowers	transfer of pollen from anther to stigma
Pollination	transfer of pollen from anther to stigma	plant growth in response to light	a single leaf arising from a plant stem	plants grown for the beauty
Margins	the edge of the leaf	unfertilized seeds	having two names	plants grown for the beauty

Taproot	one main root that grows deep into the soil	plants grown for the beauty	enlarged terminal part of the pistil	cells that surround the stoma
Mesophyll	tissue of the leaf where photosynthesis occurs	area of the root where cells mature	transfer of pollen from anther to stigma	area of the root where plant cells reproduce
Corolla	collectively, all of the petals of the flower	collectively, all the sepals of a flower	a bud at the tip of a stem	reproductive part of the plant

Ovules	unfertilized seeds	hard and rigid stems	having two names	the edge of the leaf
Vegetative bud	a bud at the tip of a stem that will produce further stem growth	a segment of a stem between two nodes	a bud at the tip of a stem that will produce flowers	part of the pistil that receives the pollen
Style	enlarged terminal part of the pistil	a bud at the tip of a stem	reproductive part of the plant	plants grown for the beauty

Petals	brightly colored, sometimes fragrant portion of the flower	surface layer on the lower and upper side of the leaf	enlarged terminal part of the pistil	small green leaflike structures found at the base of the flower
Leaf blade	the wide portion of the leaf in which photosynthesis occurs	tissue of the leaf where photosynthesis occurs	part of the pistil that receives the pollen	area of the root where cells mature
Guard cells	cells that surround the stoma	the edge of the leaf	a bud at the tip of a stem	structure that supports the anther

Bract	modified leaf that is often brightly colored and showy	cells that surround the stoma	a segment of a stem between two nodes	structure that supports the anther
Anther	portion of the male part that contains and manufactures the pollen	one main root that grows deep into the soil	male part of the flower that contains the pollen, anther and filament	part of the pistil that receives the pollen
Compound leaf	two or more leaves arising from a common point on the stem	a single leaf arising from a plant stem	transfer of pollen from anther to stigma	one main root that grows deep into the soil

Stems	the above ground part of plants that supports leaves and flowers	a bud at the tip of a stem	part of the pistil that receives the pollen	structure that supports the anther
Tubers	modified underground stems that store large amounts of food (usually starch)	modified leaf that is often brightly colored and showy	stems that are tender and non-winter hardy	one main root that grows deep into the soil
Pollen	small grains that are necessary for fertilization in the flower	brightly colored, sometimes fragrant portion of the flower	tiny hair like extensions that increase the surface area of the root	small green leaflike structures found at the base of the flower

Flower	reproductive part of the plant	enlarged terminal part of the pistil	plants grown for the beauty	the edge of the leaf
Simple leaf	a single leaf arising from a plant stem	transfer of pollen from anther to stigma	a bud at the tip of a stem	a segment of a stem between two nodes
Herbaceous	stems that are tender and non-winter hardy	a bud at the tip of a stem	mature ovary; seed	cells that surround the stoma

Area of cell elongation	area of the root where plant cells grow and add length to the root	area of the root where cells mature	area of the root where plant cells reproduce	one main root that grows deep into the soil
Nut	a fruit or seed contained within a removable outer cover	area of the root where plant cells reproduce	a segment of a stem between two nodes	part of the pistil that receives the pollen
Taxonomy	systematic classification of plants and animals	cells that surround the stoma	collectively, all the sepals of a flower	structure that supports the anther

Phototropism	plant growth in response to light	transfer of pollen from anther to stigma	cells that surround the stigma	structure that supports the anther
Area of cell division	area of the root where plant cells reproduce	area of the root where plant cells grow and add length to the root	part of the pistil that receives the pollen	plants grown for the beauty
Leaf	the main organ of photosynthesis and transpiration in higher plants; consisting of stipule, petiole and blade	area of the root where plant cells reproduce	the wide portion of the leaf in which photosynthesis occurs	one main root that grows deep into the soil

Stoma	small openings, usually on the lower side of the leaf that control movement of gases	surface layer on the lower and upper side of the leaf	small pores on the stem that allow for passage of gases	the angle between the upper side of the steam and a leaf, branch or petiole
Fruit	mature ovary; seed	unfertilized seeds	having two names	hard and rigid stems
Sepals	small green leaflike structures found at the base of the flower	brightly colored, sometimes fragrant portion of the flower	collectively, all the sepals of a flower	collectively, all of the petals of the flower

Spongy layer	lower, irregular layer in the leaf that allows the veins, or vascular bundle, to extend into the leaf	flower containing all of the parts: stamen, pistil, petal and sepals	top-most layer of the leaf; waxy protective covering of the leaf	portion of the male part that contains and manufactures the pollen
Fibrous roots	part of a root system in which roots branch to such an extent that no single root grows larger than the rest	a bud at the tip of a stem	area of the root where plant cells grow and add length to the root	part of the pistil that receives the pollen
Woody	hard and rigid stems	unfertilized seeds	having two names	mature ovary; seed

Species	the basic unit in the classification system whose members have similar structure, common ancestors, and maintain their characteristics; subgroup of genus	a bud at the tip of a stem that will produce further stem growth	a bud at the tip of a stem that will produce flowers	tiny hair like extensions that increase the surface area of the root
Stigma	part of the pistil that receives the pollen	structure that supports the anther	area of the root where plant cells reproduce	area of the root where cells mature
Flowering bud	a bud at the tip of a stem that will produce flowers	a segment of a stem between two nodes	a bud at the tip of a stem that will produce further growth	a bud at the tip of a stem

Imperfect flower	flower that is missing one or more of the following parts: stamen, pistil, petals or sepals	the angle between the upper side of the stem and a leaf, branch or petiole	small pores on the stem that allow for passage of gases	female part of the flower consisting of the stigma, style, ovary and ovules
Pistil	female part of the flower consisting of the stigma, style, ovary and ovules	the angle between the upper side of the stem and a leaf, branch or petiole	part of the pistil that receives the pollen	surface layer on the lower and upper side of the leaf
Vascular bundles	a strand of vascular tissues (both xylem and phloem) in a plant stem	two or more leaves arising from a common point on the stem	a segment of a stem between two nodes	a single leaf arising from a plant stem

Corms	short, vertical underground stem that stores food (occurs in gladioli, crocuses and water chestnuts)	short, underground stem that's surrounded by leaves that contain stored food (occurs in tulips, lilies and onions)	modified underground stems that store large amounts of food (usually starch)	specialized roots that grow from uncommon places, such as stems and leaves
Terminal bud	a bud at the tip of a stem	cells that surround the stoma	hard and rigid stems	the edge of the leaf
Caylx	collectively, all the sepals of a flower	a bud at the tip of a stem	the edge of the leaf	collectively, all of the petals of the flower

Ornamental plants	plants grown for the beauty	the edge of the leaf	mature ovary; seed	plant growth in response to light
Xylem	vascular tissue that carries water upward from the roots to every part of a plant	tiny hair like extensions that increase the surface area of the root	surface layer on the lower and upper side of the leaf	stems that are tender and non-winter hardy
Perfect flower	flower containing all of the parts: stamen, pistil, petal and sepals	modified leaf that is often brightly colored and showy	one main root that grows deep into the soil	flower that is missing one or more of the following parts: stamen, pistil, petals or sepals

Chloroplasts	capture energy from sunlight and use it to produce food for the cell	a bud at the tip of a stem that will produce flowers	surface layer on the lower and upper side of the leaf	part of the pistil that receives the pollen
Axillary bud	a structure that has the potential to form a lateral shoot or branch. The bud appears in the angle formed between a leaf and a stem	a bud at the tip of a stem that will produce further stem growth	structure that supports the anther	a bud at the tip of a stem that will produce flowers
Area of cell maturation	area of the root where cells mature	part of the pistil that receives the pollen	a bud at the tip of a stem	area of the root where plant cells reproduce

Vegetable	any herbaceous plant whose fruit, seeds, roots, tubers, bulbs, stems, leaves or flower parts are used as food	a fruit or seed contained within a removable outer cover	a bud at the tip of a stem that will produce flowers	area of the root where plant cells reproduce
Ovary	female organ that produces eggs or female sex cells; also, that portion of the flower that contains the ovules or seeds	brightly colored, sometimes fragrant portion of the flower	small green leaflike structures found at the base of the flower	a bud at the tip of a stem that will produce flowers
Root hairs	tiny hair like extensions that increase the surface area of the root	area of the root where plant cells grow and add length to the root	one main root that grows deep into the soil	surface layer on the lower and upper side of the leaf

Axil	the angle between the upper side of the stem and a leaf, branch or petiole	female part of the flower consisting of the stigma, style, ovary and ovules	the above ground part of plants that supports leaves and flowers	small pores on the stem that allow for passage of gases
Lenticels	small pores on the stem that allow for passage of gases	a bud at the tip of a stem that will produce flowers	surface layer on the lower and upper side of the leaf	part of the pistil that receives the pollen
Genus	(plural is genera) a closely related and definable group of plants comprising one or more species; the taxonomic category between family and species	two or more leaves arising from a common point on the stem	the main organ of photosynthesis and transpiration in higher plants; consisting of stipule, petiole and blade	a single leaf arising from a plant stem

Bulbs	short, underground stem that's surrounded by leaves that contain stored food (occurs in tulips, lilies and onions)	modified underground stems that store large amounts of food (usually starch)	short, vertical underground stem that stores food (occurs in gladioli, crocuses and water chestnuts)	portion of the male part that contains and manufactures the pollen
Variety	a subdivision of a species, it has various inheritable characteristics of form and structure that are continued through both sexual and asexual propagation	a bud at the tip of a stem that will produce further stem growth	modified leaf that is often brightly colored and showy	a strand of vascular tissues (both xylem and phloem) in a plant stem
Epidermis	surface layer on the lower and upper side of the leaf	the edge of the leaf	one main root that grows deep into the soil	top-most layer of the leaf; waxy protective covering of the leaf

Filament	structure that supports the anther	a bud at the tip of a stem	cells that surround the stoma	the edge of the leaf
Palisade cells	elongated, vertical cells that give the leaf strength and manufacture food	stems that are tender and non-winter hardy	one main root that grows deep into the soil	portion of the male part that contains and manufactures the pollen
Binomial	having two names	unfertilized seeds	a bud at the tip of a stem	the edge of the leaf
Which of the following plants can symbiotically fix nitrogen?	lentils	cotton	wheat	corn
A fertilizer that is a high pressure liquid and 82.2% nitrogen is	anhydrous ammonia	urea	82% nitrogen solution	aqua ammonia

Potassium fertilizer would be needed most on	clay loam soil	sandy loam soil	potassium rates are not affected by soil type	sandy soil
Soil structure is defined as	the way sand, silt and clay are grouped together	the way the soil was built by glaciers	the ability of soil to be used in supporting buildings	the percent of sand, silt and clay
The soil with the best water holding capacity would be	clay loam	sand loam	sand	silt loam
Wind erosion that moves small sized particles over great distances is what type of erosion?	surface creep	sheet	splash	rill
An insecticide that moves throughout the plant is	systemic	contact	photosynthetic	juvenile
Which of the following signal words represent the greatest hazard?	danger	toxic	hazard	warning
One limitation of a no-till system is	certain pests may be more of a problem	increases fuel costs	increases machinery costs	requires more labor
A hybrid is	offspring of two parents that are different in one or more heritable characteristics	the most expensive seed source	a cultivated variety within a plant species that is different from other members of its species	a male plant
A cultivar is	a cultivated variety within a plant species that is different from other members of its species	a male plant	offspring of two parents that are different in one or more heritable characteristics	the most expensive seed source
The label directs you to add a spreader-sticker to the tank mix. The application rate for the spreader-sticker (surfactant) is 3 quarts per 100 gallons of water. You need to mix 115 gallons of spray. How much spreader-sticker do you need?	110 oz	441 oz	34.5 oz	55 oz

You have a fungicide with a 50WP formulation. The label recommends 3 pounds of active ingredient per acre applied. How much product do you need to apply to meet this recommendation?	6 pounds	8 pounds	2 pounds	4 pounds
You are planting 40 acres of pinto beans. You want to plant 60 pounds of viable seed per acre. The seed you purchased is 95% pure with a germination of 95%. How many actual pounds must you plant?	2805 pounds	3100 pounds	3565 pounds	1855 pounds
Integrated pest management (IPM) is pest control based on the principle of	management of pest populations through chemical and nonchemical procedures	pest eradication through a management program which combines using various pesticide groups at established time periods	pest eradication through chemical and nonchemical management procedures	management of pest populations through a combination of various chemical pesticide groups
Plant diseases native to an area and generally at a low level are called	endemic	epidemic	pathogenic	organismal
Most fungicides are applied	as protectants	as eradicants	to control bacteria	after infection has occurred
Plant diseases occur when the following occur at the same time:	a susceptible plant, a virulent pathogen and a favorable environment	a susceptible plant, a virulent pathogen and insect pests	a virulent pathogen, an environment favorable for disease and insect pests	a susceptible plant, insect pests and freezing temperatures
Management of plant diseases	can be successfully accomplished with an integrated approach utilizing resistant plants, cultural controls and chemicals	is never a problem if you use the right chemical	occurs naturally during rainy weather	is most effectively accomplished with fungicides

It may be necessary to repeat an application of a foliar *ex. Leafblights) fungicide because	the plant continues to produce new unprotected foliage	the fungi become resistant to the fungicide	new diseases become a problem	the disease becomes more severe with time
Viruses are transmitted between plants	by insects, mechanically, or by pollen	always by insects	spores	by wind
An example of an insect that is a predator is a	green lacewing	aphid	honey bee	grasshopper
There are _____ sections of land in a township	36	72	16	6
The lifecycle of a plant that grows vegetation the first year then flowers and produces seed the next year is a	biennial	winter annual	summer annual	perennial
Winter varieties of crops need a cool or freezing period in order to insure the plant will flower the next year. For example winter wheat. This process is called	vernalization	glutenizing	scarification	bolting
The tillers of a plant can best be described as	stems	roots	leaves	crown
The most common type of corn grown in the United States is	dent	flint	pop	sweet
Select the condition that could help reduce pesticide volatilization	incorporation	small droplets	high air temperatures	low relative humidity
Spray drift is the least when which of the following conditions exist?	droplet size increases, wind speed decreases	droplet size increases, wind speed increases	droplet size decreases, wind speed decreases	droplet size decreases, wind speed increases
Drift problems can be reduced by	placing a spray boom as close to the target as possible	lowering pressure and decreasing the nozzle orifice	increasing pressure and increasing the nozzle orifice	spraying upwind of a sensitive area and leaving an untreated border
The average water needs of a plant are greatest when	the plant is nearing or in reproductive stage	the plant has reached maturity	the seed is placed in the soil	the plant is in the cotyledon stage
What improves the chances that a corn plant survives a frost?	location of the plant growing point	rooting depth	insecticide used	soil texture

Which of the following plants best tolerates drought?	perennial forages	soybeans	small grains	corn
The primary advantage of fallowing land is	improve soil moisture	improve soil structure	improve soil micro organisms	prevent erosion
What advantage does a crop rotation system have over a single crop system?	helps break pest cycles	allows farmers maximum participation in government commodity programs	reduces chances of a crop failure	requires less machinery
The symptoms are: chlorotic leaves, with yellowish, reddish or purplish tints developing, leaves falling prematurely and smaller plants with a lower yield. All symptoms of	nitrogen deficiency	iron deficiency	aphid infestation	zinc deficiency
Which of the following nutrients becomes more available as the pH increase? (becomes more alkaline)	calcium	manganese	iron	copper
In small grain production, jointing refers to which of the following?	the first node is visible	the flag leaf has emerged	tiller production	the head is in the boot
Your agronomist suggests applying a 35-0-0-10 fertilizer to your land. The 10 represents 10%	sulphur	lime	boron	zinc
In some cases, one can estimate the amount of organic matter found in the soil until it becomes totally black. Soil is black when the organic matter content is equal to or greater than _____ percent	5	4	2	1
Your soil test recommends 150 pounds of nitrogen per acre applied to your 25 acre field. How much 35-0-0 do you need to apply to meet the recommendation for this field?	429 lbs./acre	150 lbs./acre	444 lbs./acre	245 lbs./acre
Which of the following is NOT a plant pathogen?	weeds	nematodes	fungi	bacteria
In general, the optimum pH for the growth of most plants is between	6.0 - 6.5	7.0 - 7.5	4.5 - 5.0	5.0 - 5.5
Which of the following definitions best describes a petiole?	the stem attached to the leaf	the vein structure in the leaf	the edge of the leaf	the surface of the leaf
Which of the following conditions is best for long-term seed storage?	low temperature, low relative humidity	hot and dry	high relative humidity and high temperatures	varying temperatures and low relative humidity
_____ is when a plant produces a chemical toxin that impairs the growth of a different plant	Allelopathy	Antibiosis	Autotoxicity	Symbiosis

The NW 1/4 Sec. 12 T 19 R 32 contains a maximum of:	160 acres	320 acres	40 acres	80 acres
What type of wheat is generally used to produce spaghetti noodles?	Durum	Hard Red Winter	Soft White	Hard White
Vernalization is a process some plants require to flower and produce seed. An example of a crop that needs vernalization is:	winter wheat	cotton	dent corn	sweet corn
Jim, a wheat farmer in Texas, is planting a field of wheat which measures 1419' by 1320'. He is using a no-till drill and applying his fertilizer at the same time he seeds. He is applying 12 gallons per acre of 28% liquid nitrogen, (2.00 pounds of N per gallon) at a cost of $1.15/gallon and 20 pounds per acre of a starter fertilizer, 11-52-0, at a cost of $680/ton. He is seeding at a rate of 65 pounds of seed per acre and figures he will need an additional 10% seed for corners. How many acres are in the field Jim is planting?	43 acres	58 acres	14.3 acres	13.2 acres
Jim, a wheat farmer in Texas, is planting a field of wheat which measures 1419' by 1320'. He is using a no-till drill and applying his fertilizer at the same time he seeds. He is applying 12 gallons per acre of 28% liquid nitrogen, (2.00 pounds of N per gallon) at a cost of $1.15/gallon and 20 pounds per acre of a starter fertilizer, 11-52-0, at a cost of $680/ton. He is seeding at a rate of 65 pounds of seed per acre and figures he will need an additional 10% seed for corners. How many pounds of nitrogen is Jim applying at the time of seeding?	38.08 pounds	45 pounds	2.2 pounds	35.88 pounds
Jim, a wheat farmer in Texas, is planting a field of wheat which measures 1419' by 1320'. He is using a no-till drill and applying his fertilizer at the same time he seeds. He is applying 12 gallons per acre of 28% liquid nitrogen, (2.00 pounds of N per gallon) at a cost of $1.15/gallon and 20 pounds per acre of a starter fertilizer, 11-52-0, at a cost of $680/ton. He is seeding at a rate of 65 pounds of seed per acre and figures he will need an additional 10% seed for corners. How many pounds of phosphorus is Jim applying at seeding time?	10.4 pounds	52 pounds	20 pounds	15.3 pounds

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Jim, a wheat farmer in Texas, is planting a field of wheat which measures 1419' by 1320'. He is using a no-till drill and applying his fertilizer at the same time he seeds. He is applying 12 gallons per acre of 28% liquid nitrogen, (2.00 pounds of N per gallon) at a cost of $1.15/gallon and 20 pounds per acre of a starter fertilizer, 11-52-0, at a cost of $680/ton. He is seeding at a rate of 65 pounds of seed per acre and figures he will need an additional 10% seed for corners. How many pounds of the seed wheat should Jim order from his local co-op? (round up if needed to the next pound)	3075 pounds	65 pounds	279 pounds	2795 pounds
A benefit of a no-till cropping system is:	less fuel per acre is used	machinery used in no-till systems is less expensive	crop disorders are less of a problem	insect problems are usually reduced
A soil is considered to be an acid soil if it has a pH:	below 6.5	higher than 7.5	6.6 to 7.4	none of the answers listed
Purple Seed Stain is found in:	soybeans	cotton	corn	wheat
A definition of an annual plant is:	a plant that grows, flowers and reproduces in one growing season	a plant that grows one year then flowers and reproduces the next	a plant that reproduces only by vegetative parts	a plant that lives more or less indefinitely, keeps coming back each year
The release of a substance by one plant that is toxic to another plant is known as:	allelopathy	aroma volatile	toxicity aroma	abiotic
The fixation of nitrogen from the atmosphere occurs in:	legumes such as clovers, peas, alfalfa, beans	vegetable crops such as carrots, squash, watermelon	cereal grains such as wheat, barley, oats	oilseed crops such as canola
From the following list, the oral LD50 value representing the *most toxic* poison is:	110 mg/kg	390 mg/kg	480 mg/kg	5,000 mg/kg

Your crop advisor is counting plants in your corn field to determine plant population. The corn is planted in 30 inch rows with an average of 38 plants per 20 foot length. What is the plant population per acre?	33,100	37,540	41,320	29,620
A panicle type of seed head would be found on which of the following plants?	rice	wheat	soybeans	corn
Which of the different stages of growth of a corn plant is most affected by drought?	rooting	reproductive	cotyledon	dry down before harvest
Most noxious weeds and grasses reproduce by underground stems that produce new plants. These underground stems are called:	rhizomes	stolons	tillers	adventitious roots
Which of the four following crops would be best in breaking up a compact soil layer or hard pan?	canola	wheat	strawberries	corn
For what does IPM stand?	Integrated Pest Management	Intensive Personnel Management	Intensive Pest Manipulation	Intensive Pesticide Management
Which of the following nutrients is considered a secondary nutrient?	sulfur	potassium	phosphorus	zinc
You have noticed some of your grass seed heads have a black growth in the florets instead of a seed. This plant disorder is probably:	smut	a nutrient deficiency	TMV (Tobacco Mosaic Virus)	nematodes
Epinasty is a term used to describe a plant that:	downward bending of the leaves or other plant parts	is in full bloom	is close to maturity	has insect infestation
The best way to improve the CEC (cation exchange capacity) of your soil is to:	add organic matter to your soil	rotate crops	use a summer fallow/crop rotation	use anhydrous ammonia fertilizer
Which of the following classes of insecticides requires the most thorough spray coverage?	contact	systemic	photosynthetic	seed treatment
The microbial conversion of organic matter nutrients into inorganic ions describes:	mineralization	mass flow	surface creep	diffusion
Increasing the pH on certain soils increases the availability of:	cations like calcium and magnesium	anions like iron	soil moisture	microbes and earthworms
Lowering the pH on certain soils increases the availability of:	anions like iron	soil moisture	microbes and earthworms	cations like calcium and magnesium

A crop of corn can best take up which of the following forms of nitrogen?	ammonium and nitrate	nitrite alone	nitrogen from the atmosphere	ammonium and nitrite
A fertilizer that is a high pressure liquid and is 82% nitrogen is:	anhydrous ammonia	urea	aqua ammonia	0-82-0 solution
Plant tissue analysis can give information on:	additional fertility needs	harvest date	GMO or not	number of degree days
The most severe type of soil erosion is:	gully	rill	surface creep	splash
Using dual tires on equipment:	has little or no effect on the amount of surface compaction	increases erosion	decreases erosion	increases the amount of surface compaction
An example of biological aphid control is:	introduction and protection of natural predators	using an insect growth regulator	destroying all natural predators	setting and maintaining traps
Why is it important to spray pre emergence herbicides before a rain or scheduled irrigation?	move the herbicide into the weed germination zone	to decrease the chances of chemical run off	to decrease the rate of microbial activity	decrease the rate of chemical breakdown
A wheat plant would be damaged most by a frost at what state of development?	just before it heads out	just before harvest	pre-emergence	early tillering
If part of a field of corn is showing stripped leaves, what caused this injury?	hail	frost	aphids	moisture
If a farmer uses a disc-chisel in a tillage system, these are considered:	primary tillage	no-till	residue enhancers	secondary tillage
Banding fertilizer too close to the seed:	draws moisture away from the seed	is the most economical way of applying fertilizer	will increase productivity	is the best use of fertilizer
Often times red wheat is sold on a protein basis. What can influence the protein level in red wheat?	All of the answers listed	amount of fertilizer, especially nitrogen	amount of moisture during the growing cycle	genetics
A plant that produces a long coleoptile would have an advantage in:	a dry climate	a warm climate	a wet climate	a cold climate

Tillers of a plant can best be described as:	stems	roots	leaves	crown
Fallowing land can best be described as:	land left idle for one year for weed control or moisture retention	land in a government program for wildlife enhancement	land used for recreational purposes	land set aside for homes or other structures
A rhizome can be found on which of the following plants?	Bermuda grass	strawberry	sugarcane	Kentucky Bluegrass
Alluvial soils are soils that have been moved by _____.	water	volcano	wind	glaciers
Which of the following plants are not able to symbiotically fix nitrogen?	cotton	sweet clover	lentils	peas
In order for nitrogen fixation to occur in legumes, which of the following must be present in the soil?	rhizobium bacteria	phosphorus fertilizer	a cation that reacts with organic matter	gram positive bacteria
Nitrogen fixation is a process by which atmospheric nitrogen is converted to _____.	ammonia	sulfur	16-16-16	urea
Seed inoculation treatments for soybean production may be needed if _____.	soybeans have not been grown in the field before	soil pH is 7 or above	a soil test indicates a high amount of sulfur	the soil has a high clay content
An example of a plant that has pinnately compound leaves is _____.	puncture vine	field bindweed	morning glory	Canada Thistle
An example of a parasitic plant is _____.	dodder	watermelon	alfalfa	wild carrot
Soils that warm up more slowly in spring, are harder to till, hold water and nutrients better than other soils are _____.	clay	silt	forest soils	sand
The way sand, silt and clay are grouped together is called _____.	soil structure	soil compaction	soil geology	soil profile
Clay soils would most likely be deficient in _____.	N	P	K	S
Surface creep is erosion caused by _____.	wind	glacier	tillage	water
It is found at the base of the leaf blade of grass plants. It is the outgrowth from the sheath and can be used to identify grasses. This plant structure is a _____.	ligule	petiole	node	crown

Your soil test recommends 60 pounds of nitrogen per acre applied to your quarter section field. How much 32-0-0 do you need to apply per acre to meet this recommendation?	190 lbs.	150 lbs.	444 lbs.	245 lbs.
Which of the following plant is a perennial?	alfalfa	bull thistle	sweet clover	pigweed
The majority of tillers on a wheat plant develop from the _____.	crown	stems	roots	leaves
The secondary nutrients are _____.	calcium, magnesium and sulfur	copper, magnesium and sodium	sulfur, calcium and phosphorus	calcium, manganese and sulfur
The food source for an emerging plant is the _____.	endosperm	roots	cotyledons	coleoptile
A method to avoid herbicide resistance from occurring is to _____.	rotate crops and herbicides with different modes of action	plant forage crops	plant the same crop but different variety	use a stronger dose of herbicide
A system used by agronomists to identify the growth and development of cereal grains is the _____.	Feekes scale	Tillering scale	P. T. Hiller scale	Growth Stage scale
Oats have the following type of inflorescence:	panicle	unbrelle	spike	raceme
A barley plant is considered a _____.	monocot	unifoliate	trifoliate	dicot
Which of the following crops reproduces asexually?	sugarcane	sugar beets	canola	lentils
To what plant family does wheat belong?	gramineae	leguminoseae	gluten	brassica
Which of the following plants is not a member of the crucifereae plant family?	potato	mustard	broccoli	canola
Mustards tend to be allelopathic with grasses. Allelopathic plants produce _____.	chemical toxins that impair plant growth	symbiotic relationships with other plants	useful fertilizer for the soil	contact insecticides
Lacustrine soils are soils that have been deposited by _____.	glaciers	water	volcanos	wind
You notice some of your plants appear weak, spindly and slightly purple in color. Chances are there is a deficiency in _____.	phosphorus	potassium	chlorine	nitrogen

Additional units of an input, for example fertilizer, may not always be profitable. Which economic concept illustrates this point?	diminishing returns	break even analysis	critical profit point	maximum input ratio
You have a contract with an oil seed company for the production of 100 acres of non GMO canola. You want to treat your field with Treflon, a pre-emerge herbicide, to give your crop a start ahead of the weeds. According to your agronomist application rate is 2 pints per acre. Cost of a gallon of Treflon is $20 and application cost is $7.50 per acre. How many gallons of Treflon should you purchase?	25	8	2	20
You have a contract with an oil seed company for the production of 100 acres of non GMO canola. You want to treat your field with Treflon, a pre-emerge herbicide, to give your crop a start ahead of the weeds. According to your agronomist application rate is 2 pints per acre. Cost of a gallon of Treflon is $20 and application cost is $7.50 per acre. What is the total cost of having your field treated with Treflon?	$1,250	$2,000	$500	$750
Chemicals emitted by an organism to influence the behavior of other organisms of the same species are called _____.	pheromones	pyrithroids	surfactants	parasites
Which of the following is considered an oilseed crop?	flax	cabbage	peas	popcorn
Maximum day temperature minus minimum day temperature divided by 2 minus 32 is the formula for finding _____.	degree days	growth stage of corn	growth stage of wheat	correct temperatures to spray
You are reading a material safety data sheet and come across the term LD50. What does this mean?	It is the amount of the substance required, by body weight, to kill 50% of the population	Lethal dose diluted by 50%	50% of container is a legal dose	legal dose is diluted by 50% volume
At what stage would corn be ready to harvest?	R6	V10	VT	R1
Which nutrient is a major concern in surface water because it may stimulate algae growth?	phosphorus	calcium	sulfur	zinc
A barley farmer in Eastern Oregon desires to plant the recommended rate of 65 pounds per acre of live seed. The seed tag shows that the germination rate is 90%. How many pounds of seed should he plant?	72 pounds	80 pounds	65 pounds	58.5 pounds

Your county extension agent is counting plants in your corn field to determine plant population and eventually yield per acre. The corn is planted in 30 inch rows with an average of 42 plants per 20 foot length. What is the plant population per acre?	36,590	33,100	37,540	41,320
_____ is a mechanism by which chemical energy is converted from one form to a more usable form with the release of heat.	cellular respiration	cation exchange	carbon sequestration	vernalization
Guard cells are used to open and close the _____.	stoma	vascular system	stamen	petiole
Infested, in grain grading terms refers to _____.	insects injurious to stored grains in the sample	the amount of weed seeds in the sample	wheat of other classes in the sample	smut or ergot in the sample
Which of the following factor is not used in determining grain grades?	moisture	smell	broken or split kernels	stones
Your FFA advisor notices aphids in your chapter's greenhouse. He releases lady beetles to control the aphids. This is an example of _____.	biological control	cost savings	organic control	natural control
The fertilizer Urea _____.	most efficient if incorporated into soil	should not be used in fertilizer blends	contains 32% N	can only be used as a foliar feed for plants
Tyler has a field of corn that measures 1320' by 2640'. He has a farm average of 175 bushels per acre of corn. His soil test shows that he needs to add 160 pounds of nitrogen per acre to meet his average yield. Tyler has applied anhydrous ammonia in the fall and starter fertilizer in the spring at the same time he plants his corn. In the spring he wants to apply 60 pounds of P using a starter fertilizer, 10-50-2-0. How many acres is the field Tyler is seeding?	160	320	40	80
Tyler has a field of corn that measures 1320' by 2640'. He has a farm average of 175 bushels per acre of corn. His soil test shows that he needs to add 160 pounds of nitrogen per acre to meet his average yield. Tyler has applied anhydrous ammonia in the fall and starter fertilizer in the spring at the same time he plants his corn. In the spring he wants to apply 60 pounds of P using a starter fertilizer, 10-50-2-0. How many pounds of N is applied during the seeding process?	12	6	10	60

Tyler has a field of corn that measures 1320' by 2640'. He has a farm average of 175 bushels per acre of corn. His soil test shows that he needs to add 160 pounds of nitrogen per acre to meet his average yield. Tyler has applied anhydrous ammonia in the fall and starter fertilizer in the spring at the same time he plants his corn. In the spring he wants to apply 60 pounds of P using a starter fertilizer, 10-50-2-0. How many pounds of anhydrous ammonia should he apply this fall?	180	360	412	82
Tyler has a field of corn that measures 1320' by 2640'. He has a farm average of 175 bushels per acre of corn. His soil test shows that he needs to add 160 pounds of nitrogen per acre to meet his average yield. Tyler has applied anhydrous ammonia in the fall and starter fertilizer in the spring at the same time he plants his corn. In the spring he wants to apply 60 pounds of P using a starter fertilizer, 10-50-2-0. How many pounds of 10-50-2-0 does he need to apply to get the 60 pounds of P?	120	140	200	100