Agronomy Seaman FFA Practice Test (Sample)

Study Guide

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Questions

1. What is the term for a horizontal, creeping stem growing below the soil surface?

A. Rhizome

B. Stolon

C. Tuber

D. Bulb

2. In a corn or wheat kernel, the stored food energy used for germination is found in the:

A. Cotyledon

B. Endosperm

C. Coleoptile

D. Mesocotyl

3. Which crop is often used for human food, livestock feed, and to produce industrial products?

A. Alfalfa

B. Corn

C. Wheat

D. Sunflower

4. What causes fescue toxicity in livestock grazing tall fescue?

A. Prussic acid

B. Nitrate

C. Nematodes

D. Endophyte fungus

5. In Kansas, when is winter wheat most likely to suffer freezing injury?

A. During the tillering stage in late fall

B. During the dormant stage in the middle of winter

C. Before the jointing stage in early spring

D. After the jointing stage through the flowering stage in spring

6. Which forage crop recently regained deregulated status after being temporarily withdrawn due to a lawsuit?

A. Alfalfa

B. Sudangrass

C. Tall fescue

D. Silage corn

7. What is the advantage of using conservation tillage practices?

A. Increased labor costs

B. Reduced soil erosion

C. Higher use of water

D. Less organic matter retention

8. Which dry nitrogen fertilizer carrier has an analysis of 46-0-0?

A. Urea

B. Urea-ammonium nitrate (UAN)

C. Anhydrous ammonia

D. Diammonium phosphate (DAP)

9. What are the top two crops in value in the US?

A. Corn and soybeans

B. Corn and wheat

C. Corn and soybeans; in Kansas, corn and wheat

D. Wheat and soybeans

10. What practice is often recommended to prevent runoff of excess fertilizers into waterways?

A. Cover cropping

B. Frequent tillage

C. Applying fertilizers in high volumes

D. Planting crops in monocultures

Answers

1. A
2. B
3. B
4. D
5. D
6. A
7. B
8. A
9. C
10. A

Explanations

1. What is the term for a horizontal, creeping stem growing below the soil surface?

A. Rhizome

B. Stolon

C. Tuber

D. Bulb

The term for a horizontal, creeping stem that grows below the soil surface is a rhizome. Rhizomes are a type of underground stem that can produce new shoots and roots at nodes along their length, allowing them to spread vegetatively. This growth habit is crucial for the survival of many plant species, as it enables them to colonize new areas effectively and can also store energy and nutrients. In contrast, stolons are similar structures but grow above the soil surface. Tubers are swollen underground stems or roots that store nutrients and energy, like potatoes, while bulbs are storage organs consisting of a short stem with fleshy leaves or scales that can develop into new plants. Understanding these distinctions is essential for proper identification and knowledge of plant biology and propagation methods in agronomy.

2. In a corn or wheat kernel, the stored food energy used for germination is found in the:

A. Cotyledon

B. Endosperm

C. Coleoptile

D. Mesocotyl

The stored food energy used for germination in a corn or wheat kernel is found in the endosperm. The endosperm is a tissue that provides essential nutrients, including carbohydrates, proteins, and some fats, which serve as the primary source of energy for the developing embryo during germination. As the seed begins to sprout, the enzymes are activated to break down the starches stored in the endosperm, converting them into simple sugars that the embryo can utilize for energy. This process is crucial because the young plant relies on these stored nutrients until it can develop sufficient leaves to begin photosynthesis and produce its own energy. While other parts of the seed have distinct functions—such as the cotyledon, which may serve as the first leaves in some plants, the coleoptile, which protects the emerging shoot, and the mesocotyl, which connects the seed to the surface and can aid in early growth—they do not primarily store the energy needed for germination. Instead, they facilitate various aspects of seedling development and emergence.

3. Which crop is often used for human food, livestock feed, and to produce industrial products?

A. Alfalfa

B. Corn

C. Wheat

D. Sunflower

Corn is a versatile crop that serves multiple purposes, making it an integral part of agriculture and food systems. It is widely cultivated for human consumption, in forms such as cornmeal, corn syrup, and tortillas. Additionally, corn is a primary source of livestock feed, as it provides energy and essential nutrients for animals, thus supporting the livestock industry. Furthermore, corn is also utilized in the production of various industrial products, such as biofuels (like ethanol), plastics, and biodegradable materials. This multifaceted usage not only enhances its economic value but also highlights its significance in sustainable agriculture and industrial practices. In contrast, other options like alfalfa are primarily used as livestock feed, while wheat is predominantly a staple crop for human consumption. Sunflower is mainly grown for its seeds and oil extraction, making its industrial applications more limited in comparison to corn.

4. What causes fescue toxicity in livestock grazing tall fescue?

A. Prussic acid

B. Nitrate

C. Nematodes

D. Endophyte fungus

Fescue toxicity in livestock grazing tall fescue is primarily caused by an endophyte fungus, which lives symbiotically within the grass. This fungus, known as Neotyphodium coenophialum, produces toxic compounds called alkaloids. These alkaloids can have various detrimental effects on livestock, including reduced feed intake, weight gain, and reproductive issues. The presence of the endophyte is often beneficial for the plant as it helps it resist pests and environmental stress, but it poses significant health risks to grazing animals. The other options are associated with different kinds of toxicity or health issues in livestock but do not specifically pertain to tall fescue. For example, prussic acid is typically associated with sorghum species, while nitrates can accumulate in various forages, leading to toxicity under certain conditions. Nematodes are parasitic worms that affect plant health and productivity but are not responsible for the specific toxic effects linked to fescue. Thus, the endophyte fungus is the correct and most relevant cause of fescue toxicity in livestock.

5. In Kansas, when is winter wheat most likely to suffer freezing injury?

A. During the tillering stage in late fall

B. During the dormant stage in the middle of winter

C. Before the jointing stage in early spring

D. After the jointing stage through the flowering stage in spring

Winter wheat is most susceptible to freezing injury after the jointing stage through the flowering stage in spring due to the plant's physiological development. As winter wheat progresses through its growth stages, it becomes increasingly sensitive to environmental stressors, particularly temperature fluctuations. During the jointing stage, the plant is beginning to form its reproductive structures which are critical for yield. If temperatures drop significantly at this time, it can lead to damage to these structures, adversely affecting yield potential. Furthermore, once the plant reaches the flowering stage, it is even more vulnerable to freezing temperatures. If a freeze occurs during flowering, it can result in severe damage to the developing kernels, leading to additional decrease in yield and quality of the harvested wheat. In contrast, during the tillering stage in late fall and the dormant stage in the middle of winter, winter wheat is generally more resilient due to its biological adaptations for surviving cold weather. While still needing protection from extreme temperatures, the plant's growth processes are not as critical at these times, allowing it to withstand colder conditions. Thus, it is during the late spring stages that freezing temperatures pose the greatest risk to winter wheat.

6. Which forage crop recently regained deregulated status after being temporarily withdrawn due to a lawsuit?

A. Alfalfa

B. Sudangrass

C. Tall fescue

D. Silage corn

Alfalfa is the forage crop that has recently regained deregulated status after being temporarily withdrawn due to a lawsuit. The controversy surrounding genetically modified (GM) alfalfa focused on environmental concerns and potential impacts on non-GM crops. After thorough review and discussion, regulatory agencies decided to reinstate the deregulated status, allowing for its cultivation without the previous restrictions. This decision is significant, as alfalfa is a crucial forage crop widely used in livestock feeding, and its genetic modifications can improve qualities such as pest resistance, enhancing overall production efficiency. Understanding the context of alfalfa's deregulated status highlights the ongoing dialogue between agricultural innovation and environmental stewardship, showcasing the complexities that come with the adoption of GMO crops in forage production.

7. What is the advantage of using conservation tillage practices?

A. Increased labor costs

B. Reduced soil erosion

C. Higher use of water

D. Less organic matter retention

The advantage of using conservation tillage practices primarily lies in their ability to reduce soil erosion. This method involves minimizing the disturbance of soil during the preparation for planting, which helps maintain the soil's structure and composition. By leaving crop residues on the surface and reducing the frequency and intensity of tilling, conservation tillage enhances soil stability and protects it from wind and water erosion. Healthy soil is crucial for sustainable agricultural production and maintaining environmental quality, as it helps retain moisture and nutrients, leading to better crop yields over time. This practice not only benefits the environment by preserving topsoil but also supports long-term agricultural viability by promoting healthier ecosystems.

8. Which dry nitrogen fertilizer carrier has an analysis of 46-0-0?

A. Urea

B. Urea-ammonium nitrate (UAN)

C. Anhydrous ammonia

D. Diammonium phosphate (DAP)

Urea is a solid dry nitrogen fertilizer that has a guaranteed analysis of 46-0-0, indicating it contains 46% nitrogen content, and no phosphorus or potassium. This high nitrogen concentration makes urea a popular choice for agricultural settings where crops require significant amounts of nitrogen for growth and development. In contrast, urea-ammonium nitrate (UAN) is a liquid fertilizer that combines urea with ammonium nitrate but does not have the same analysis as urea alone. Anhydrous ammonia is another nitrogen source but is not a dry fertilizer; it is a gas that must be injected into the soil. Diammonium phosphate (DAP) is a fertilizer that contains both nitrogen and phosphorus but has a different analysis and does not meet the criteria of 46-0-0. Therefore, the correct answer is based on the specific analysis that urea has a significantly higher nitrogen content compared to the other options presented.

9. What are the top two crops in value in the US?

A. Corn and soybeans

B. Corn and wheat

C. Corn and soybeans; in Kansas, corn and wheat

D. Wheat and soybeans

The top two crops in value in the United States are indeed corn and soybeans. Corn is the most widely produced crop, primarily grown for several purposes including animal feed, ethanol production, and food products. Soybeans follow closely in terms of value due to their essential role in producing oil and as a protein source in animal feed. In certain states like Kansas, the agricultural landscape can differ slightly, with wheat also being a significant crop due to the region's climate and soil conditions that favor wheat production. However, when considering the nation as a whole, it is corn and soybeans that consistently rank as the leading crops in value across all states, reflecting their importance to both the economy and food supply chain. This understanding highlights the significance of both corn and soybeans in agricultural practices, market dynamics, and food systems in the U.S.

10. What practice is often recommended to prevent runoff of excess fertilizers into waterways?

A. Cover cropping

B. Frequent tillage

C. Applying fertilizers in high volumes

D. Planting crops in monocultures

Cover cropping is an effective practice recommended to prevent the runoff of excess fertilizers into waterways. This method involves planting crops specifically to cover the soil rather than for harvest. The roots of cover crops help to hold the soil in place, reducing erosion and preventing the nutrients from leaching into nearby water bodies. Additionally, cover crops can improve soil health by enhancing organic matter and increasing biodiversity. By incorporating cover crops into farming systems, farmers can also reduce nutrient runoff because these plants take up excess nitrogen and phosphorus from the soil, making them less available to be washed away with water during rain events. This practice not only protects water quality but also promotes better nutrient management and enhances overall sustainability in agricultural systems.