

Assume for example, that 20 lb of N are to be applied per acre to improved pasture irrigated with a traveling gun system. Travel lane spacings are 200 ft and the traveler speed is 7 ft/min (420 ft/hr). The fertilizer applied is Ammonium Nitrate (21% N; 10.73 lb/gal). The required injection rate is calculated from:

$$\text{Rate} = \frac{[100 \cdot 420 \text{ ft/hr} \cdot 200\text{ft} \cdot 20 \text{ lb/ac}]}{[43,560 \cdot 21\% \cdot 10.73 \text{ lb/gal}]}$$

$$\text{Rate} = 17.1 \text{ gph}$$

Thus the required 20 lb of N per acre would be applied by injecting 17.1 gal of Ammonium Nitrate per hour of traveling gun operation.

Safety

Make sure that the irrigation system components will not be deteriorated by the fertilizer compounds used. Handle fertilizers carefully. Wear the appropriate protective clothing and protective eyewear.

Florida law requires that irrigation systems into which fertilizers are injected be equipped with backflow prevention devices to protect the water

supply against contamination. Follow these regulations by installing backflow prevention devices before beginning to inject fertilizers and by properly maintaining and periodically testing your backflow prevention system.

Summary

Fertigation is an appropriate production practice for many Florida crops because of reduced nutrient application costs and increased yields as compared to conventional fertilizer application methods. Procedures for the calibration of fertilizer injection systems using chemical flow meters and volumetric flow rate measurements were presented. Equations were given to calculate the required fertilizer injection rates for solid set (sprinkler and micro), center pivot, and traveling gun irrigation systems. Example problems were given for each of these types of irrigation systems.

Fertilizers can be safely injected if proper safety precautions are taken. Protect yourself by wearing protective clothing and selecting and using injection equipment properly. Protect the water supply by applying the right amount of fertilizers and by using the proper backflow prevention equipment.

