

**EC33-171: Bioproduction and Machinery**

**Feedback Quiz: GIS and DSS (Open Book)**

**Total Points 10**

Name:

ID:

1. Precision Agriculture is the management strategy that uses information technologies to bring data from multiple sources to bear on decisions associated with crop production (**True/ False**)
2. GIS Data types are two types 1). \_\_\_\_\_ 2) \_\_\_\_\_
3. GIS data interpolation methods are \_\_\_\_\_

4. The Decision Support Systems are computer-based information systems that help users to select one of many alternative solutions(**True/ False**)
5. Suppose an Alfalfa Yield model was described as (Hypothetical):

$$Y=0.34+(X1*2.45) +(X2*1.4)+(X3*0.24),$$

where Y=Alfalfa yield in tons/ha, X1=plants per square foot, X2=days of regrowth, and X3= ppm of available potassium (Brase 2006, P:165). Given dummy values of X1, X2 and X3 for 5 pixels in a GIS database at a resolution of 10 m \* 10 m, please calculate alfalfa yield per pixel (tons/ha) and total yield of the 5 pixels (tons).

Pixel no.	X1 (plants)	X2 (days)	X3 (ppm)	Y (tons/ha)
1	5	34	25.62494	
2	8	30	21.65777	
3	5	30	22.4198	
4	6	23	20.59654	
	9	23	22.38173	

6. We have an IKONOS NDVI dataset, please use the following statistic model to estimate Leaf Area Index per pixel within the IKONOS GIS dataset (LAI) fitted ground from truth data and satellite observation:

$$Y=6.825x-1.636$$

Where, Y is the LAI index and x is the corresponding NDVI value per pixel within IKONOS dataset.

Pixel no.	IKONOS NDVI (x)	LAI (y)
1	0.561475623	
2	0.441912995	
3	0.553053702	
4	0.550202209	
5	0.546468961	

7. Solar radiation intercepted by the \_\_\_\_\_ is termed as Photo-synthetically Active Radiation (PAR)

8. The higher the Net Assimilation Rate (NAR ) the more efficient the species, which usually translates into less growth rates( **True/ False**)
9. LAI is near 0 at planting, and is usually 2-3 at full canopy coverage ( **True/ False**)
10. Crop Growth Rate can be expressed as:  $CGR = NAR \cdot LAI$  ( **True/ False**)