Quiz 17) March 25, 2004

17) An agricultural researcher is examining methods of protecting potatoes from fungi and other pathogens that affect potatoes during storage. There are three treatment levels; a biocide (Purogene®), ozone (O3), and an untreated control. One concern is the possible change in color of the potatoes after treatment. To test for a color change the investigator uses an instrument that measures 3 aspects of color (L-lightness (white=100-black=0), A (red/green scale value) and B (yellow/blue scale value). The investigator treats the 3 color values as 3 distinct variables of interest, each used in a separate analysis. What would be the appropriate technique to test for differences among the 3 potato treatments for the 3 variables of interest?

Table 5.3 Analysis of variance and main effect means for the effect of in-storage treatments on skin colour of Norland and Russet Burbank potatoes (Trial 1)

SOURCE	DF	Norland				Russet Burbank		
		L	a	b		L	a	b
		MS	MS	MS		MS	MS	MS
TREATMENT	2	1.15	1.38**	0.08		1.43	0.10	1.22**
REP	9	1.03**	0.30	0.31**		5.43	0.18***	0.20
ERROR	108	0.48	0.33	0.14		4.07	0.06	0.25

*, **,*** = significant at p=0.10, 0.05 or 0.01 respectively

MEANS

TREATMENT	Norland				Russet Burbank		
	L	a	b		L	a	b
CONTROL	21.0	3.07ab	2.93		22.2	1.80	4.38b
PUROGENE	21.2	2.91b	3.02		22.5	1.86	4.46b
OZONE	21.4	3.28a	2.96		22.4	1.90	4.71a

Values followed by the same letter are not significantly different (p=0.05)