

212. 温度, 土壤水分포텐셜 및 渗透處理가 옥수수 및 大豆의
發芽 및 苗伸長에 미치는 影響

塔材大學 園藝學科 成榮春

미주리대학교 農學科 마이너, 해리 시.

農科振興국 作物試驗場 朴根龍

Effect of Temperature, Soil Water Potential and Osmo-
conditioning on Germination and Seedling Elongation
of Corn and Soybeans.

Dept. of Horticulture, PAI CHAI Univ., Seong, Rak Chun

Dept. of Agronomy, Univ. of Missouri, Minor, Harry C.

Crop Experiment Station, R.D.A. Park, Keun yong

< 實驗目的 >

温度와 土壤水分의 變化가 옥수수 및 大豆의 發芽 및 苗伸長에 미치는
渗透處理의 效果를 究明하고자 遂行하였다

< 材料 및 方法 >

옥수수 品種 (DeKalb XL 72B) 및 大豆 品種 (Williams) 의 發芽와 苗伸長은 干 湿
度, 土 壤 水 分 포 텐 셽 및 비 polyethylene glycol (PEG) 8000 水準에서 測定하였다
各 品 種 의 20 處 理 種 子 를 0.2% Thiram에 處理하여 假比重 1.20으로 壓縮된 殺菌 砂
壤土에 2.0 cm 깊이로 播種 分割 區 配 置 法 4 反 復 으로 實 施 하였다.

< 結果 및 考案 >

PEG-8000을 利用한 渗透處理는 高温에서나 低土壤水分 포텐셜 條件에서 效果가
거의 없었다 大豆는 옥수수 보다 높은 苗水分 含量을 보였고 干 作物 모두 土壤
水分 포텐셜과 温度가 增加할수록 水分吸수가 增加되었다. 옥수수의 苗長은 35°C
에서는 大豆보다 短았으나 15°C에서는 短았다. 옥수수의 乾物重은 35°C에서 減
少되었고 大豆의 乾物重은 土壤水分포텐셜이 增加할수록 減少되었다 옥수수 및 大豆의
苗水分含量과 苗長은 有意性있는 正의 相關을 보였고 옥수수의 苗乾物重은 干의 干
統層數와 負의 相關을 보였으며 大豆의 苗乾物重은 苗水分含量과 負의 相關을 보
였다.

Table 1. Effect of temperature and soil water potential on seedling dry weight (g/100) of corn and soybeans.

Species	Soil water potential (MPa)	Temperature (°C)			LSD (0.05)
		15	35	mean	
Corn	-1.50	26.35	24.89	25.61	
	-0.50	26.01	24.92	25.47	
	-0.05	26.07	25.03	25.55	
	Mean	26.14	24.95		0.99
	LSD (0.05)				NS
Soybeans	-1.50	17.77	17.03	17.40	
	-0.50	17.19	17.04	17.12	
	-0.05	16.84	16.09	16.91	
	Mean	17.27	17.02		NS
	LSD (0.05)			0.26	0.37

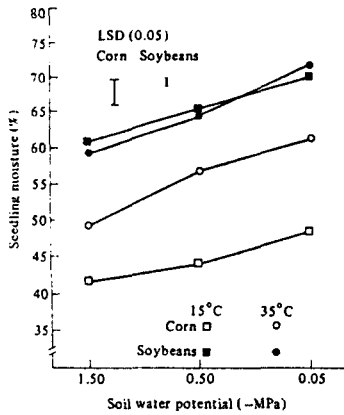


Fig. 2. Effect of temperature and soil water potential on seedling moisture content of corn and soybeans. Data are for 3 days at 35°C and 7 days at 15°C.

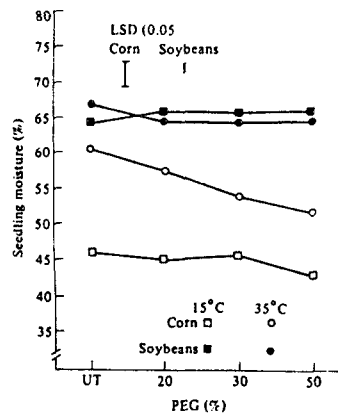


Fig. 3. Effect of temperature and PEG concentration on seedling moisture content of corn and soybeans. UT = untreated control. Data are for 3 days at 35°C and 7 days at 15°C.

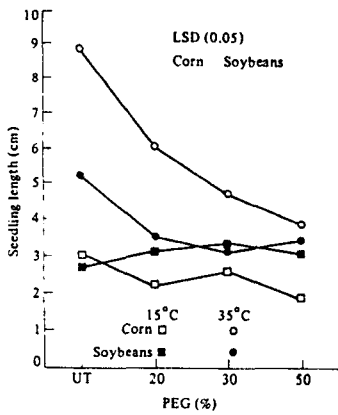


Fig. 5. Effect of temperature and PEG concentration on seedling length of corn and soybeans. UT = untreated control. Data are for 3 days at 35°C and 7 days at 15°C.

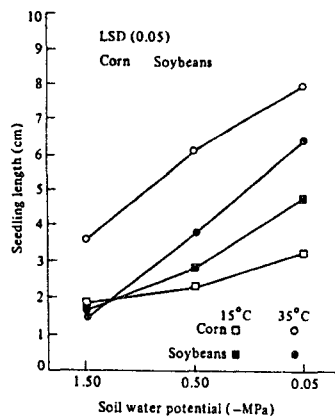


Fig. 4. Effect of temperature and soil water potential on seedling length of corn and soybeans. Data are for 3 days at 35°C and 7 days at 15°C.

Table 2. Correlation coefficients among seedling moisture content, seedling length, and seedling dry weight of corn and soybeans.

Variable	Corn seedling		Soybeans seedling	
	Moisture content	Length	Moisture content	Length
Seedling length	0.920**		0.922**	
Seedling dry weight	-0.482**	-0.413**	-0.263**	-0.143NS

** significant at the 0.01 level of error probability.