

206. 재배환경에 따른 청예수수의 생산성에 관한 연구

4. 청예용 수수-수단그라스 교잡종의 예취전후 온도가 재생, 수량 및 영양가에 미치는 영향

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Studies on the Productivity of Forage Sorghum under the Different Cultural Environment

4. Effect of Different Temperature before and after Cutting on Regrowth, Yield and Nutritional Value of Sorghum - Sudangrass Hybrid

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실 험 목 적

청예용 수수-수단그라스 교잡종의 재배 및 생산성에 관한 기초적인 해석자료를 얻기위해 예취전후 온도가 재생 관련형질, 수량 및 영양가에 미치는 영향을 검토코자 실시하였다.

재 료 및 방 법

수수-수단그라스 교잡종인 GW9110G 품종을 5월 10일 1/3000a Pot에 파종하여 출현후 Pot당 2주를 남겼다. 온도처리는 자연상태에서 생육시킨 Pot를 자동온냉조절온실에 운반하여 주간온도를 19°C, 23°C, 27°C 및 31°C (야간온도는 각각 -3°C)의 4개 수준으로 예취전 10일간, 예취후 20일간씩 온도처리한후 야외에서 생육시켰다.

실 험 결 과 및 고 찰

1. 예취전후 온도가 27°C일때 초장, 주당엽수, 경직경, 근중 및 T/R율이 컸다.
2. 예취후 재생을 위한 그루터기의 저장탄수화물 함량은 27°C, 31°C일때 19°C, 23°C 보다 많았다.
3. 예취전후 온도가 높을수록 조성유함량은 증가하나 조단백질, 조회분함량은 감소하였으며 온도와 세포막구성 물질과는 정의상관이 인정되었다.
4. 예취전후 온도별 주요형질이 건물생산에 미치는 기여도를 보면 19°C에서는 초장 및 경직경, 23°C에서는 초장 및 주당엽수, 27°C에서는 엽면적 및 경직경, 31°C에서는 초장의 기여도가 컸다.
5. 예취전후 온도에 따른 건물중 및 가소화건물중은 온도가 높을수록 유의증가 하였으나 건물소화율은 감소하였다 특히, 예취전후 온도가 19°C일때 실용적인 재생량을 기대할 수 없었다.

Table . Analysis of effects of major characters on top dry matter weight of second cutting in association with temperature before and after cutting

Characters	Plant height		No. of tiller		Stem diameter		No. of leaves		leaf area		Residu- al R <sup>2</sup>
	Single effect	Direct effect	Single effect	Direct effect	Single effect	Direct effect	Single effect	Direct effect	Single effect	Direct effect	
19 °C	0.137 (37.4)	-0.197 (11.3)	0.277 (11.3)	0.197 (21.6)	-0.477 (21.6)	0.279 (12.2)	0.310* (12.2)	0.270 (14.8)	0.107 (14.8)	0.580	
23 °C	0.098* (25.5)	-0.236 (10.3)	0.225 (10.3)	-0.271 (4.5)	-0.303 (35.2)	0.325 (19.6)	0.336* (19.6)	0.526 (11.3)	0.113 (11.3)	0.653	
27 °C	0.307* (8.7)	-0.229 (9.5)	-0.204 (9.5)	0.337** (36.1)	0.728 (36.1)	-0.759 (19.2)	0.922* (31.8)	0.874 (4.7)	0.129 (4.7)	0.941	
31 °C	0.327* (34.9)	0.845 (17.9)	-0.435 (17.9)	-0.327 (8.0)	0.185 (8.0)	0.414 (17.1)	0.625 (16.6)	-0.403 (5.1)	0.132 (5.1)	0.546	

( ) Percentages to the direct effect

1) Refer to table 2

\* and \*\* indicate significant at 0.05 and 0.01 levels, respectively

To (fresh weight) Top dry weight

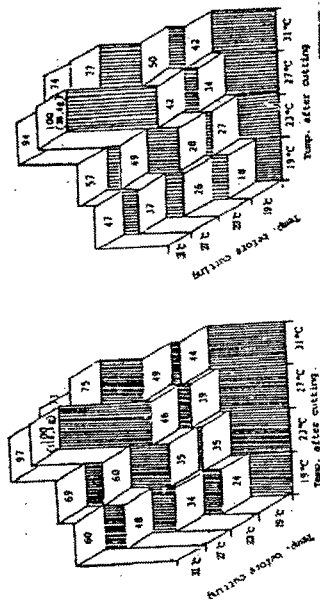


Fig . Index of top fresh weight and top dry matter weight per plant of second cutting by different temperature during 10 days before cutting and 20 days after cutting (LSD .05 TFW and TOW for temp. before and after cutting=4.9, 1.0, for reciprocal=9.8, 2.1) ( ) : Percentages to 27 °C before and after cutting

Table . The effects of different temperature before and after cutting on some regrowth characters of second cutting

Temperature (°C)	Plant height (cm)		No. of tiller (plant)		Stem diameter (mm)		No. of leaves (plant)		Root dry weight (g/plant)		T/R ratio
	Before cutting	After cutting	Before cutting	After cutting	Before cutting	After cutting	Before cutting	After cutting	Before cutting	After cutting	
19	82	84	2.9	3.0	6.0	6.2	5.8	5.8	2.8	2.8	1.09
23	84	84	3.0	3.0	6.8	6.2	3.8	3.8	1.9	1.9	1.94
27	107	107	3.4	3.4	8.2	8.2	4.1	4.1	2.1	2.1	2.78
31	107	107	3.4	3.4	8.2	8.2	4.1	4.1	2.1	2.1	2.17
Mean	90	90	3.1	3.1	6.3	6.3	4.0	4.0	2.0	2.0	1.93
19	82	84	3.6	3.6	6.4	6.8	3.7	3.7	2.0	2.0	2.00
23	84	84	3.8	3.8	8.3	6.9	4.1	4.1	2.73	2.73	2.73
27	107	107	4.3	4.3	8.6	7.1	4.2	4.2	3.14	3.14	3.14
31	107	107	4.3	4.3	8.6	7.1	4.2	4.2	3.14	3.14	3.14
Mean	98	98	3.8	3.8	7.5	6.6	3.9	3.9	2.45	2.45	2.45
19	107	107	3.1	3.1	6.1	6.6	3.3	3.3	2.21	2.21	2.21
23	108	108	3.9	3.9	7.8	6.8	4.5	4.5	2.86	2.86	2.86
27	130	130	4.8	4.8	9.4	7.9	6.7	6.7	3.96	3.96	3.96
31	118	118	4.3	4.3	9.0	7.6	6.0	6.0	3.43	3.43	3.43
Mean	118	118	4.1	4.1	8.2	7.2	5.4	5.4	3.33	3.33	3.33
19	104	104	4.0	4.0	7.7	6.5	2.0	2.0	2.00	2.00	2.00
23	112	112	4.1	4.1	8.5	7.8	2.8	2.8	2.80	2.80	2.80
27	131	131	4.9	4.9	9.5	7.5	6.5	6.5	3.85	3.85	3.85
31	113	113	4.4	4.4	8.8	7.2	5.8	5.8	3.39	3.39	3.39
Mean	113	113	4.4	4.4	8.8	7.2	5.8	5.8	3.20	3.20	3.20
LSD 5%	TAC <sup>1)</sup> 6.8	TAC <sup>2)</sup> 6.8	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.1
	TAC	TAC	6.8	6.8	0.4	0.4	0.4	0.4	0.4	0.4	0.1
	BMA	BMA	11.5	11.5	N.S	N.S	0.7	0.7	0.8	0.8	0.3

T/R : Top dry weight/Root dry weight

1) 10 days before cutting and 20 days after cutting

2) 20 days before cutting and 10 days after cutting

TAC : Temperature after cutting

BMA : Temperature before cutting

N.S : Interaction between before and after cutting

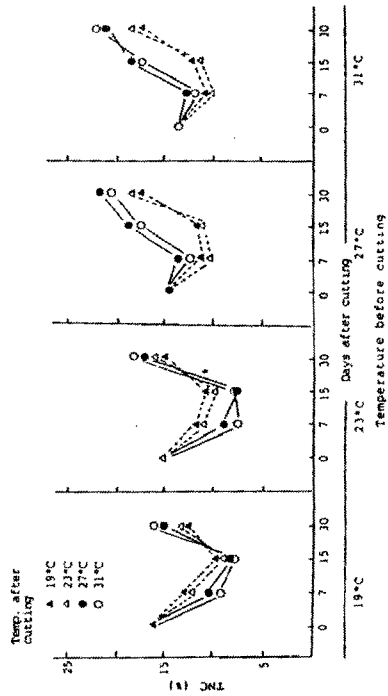


Fig . Changes in total nonstructural carbohydrate content of stubble after cutting by different temperature during 10 days before cutting and 20 days after cutting (LSD .05 for temp. before and after cutting = 0.5, for reciprocal = 1.1)