

## Forage yield and nutritive value of 30 cultivars of maize for silage in the Highland Valleys of Central Mexico

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**Introduction** In Mexico, the selection of maize cultivars for forage has mainly been based on dry matter (DM) yields, not considering nutritional quality as an important evaluation parameter. The objective of this study was to assess forage yield and nutritive value of Highland and Subtropical maize cultivars for silage in the Highland Valleys of Central México.

**Materials and methods** Thirty genotypes of maize were studied during two years (spring 1999 and 2000) in Texcoco State, México. The experiment was made using a randomised complete block design with four replications. The harvest was performed during the silage stage (30-35 % DM of the whole plant). The registered variables were: Days to silk (DS), plant height (PH), green matter yield (GMY), dry matter yield (DMY) and digestible DM yield (DDMY), crude protein (CP), cellular walls (NDF), lingo-celluloses (ADF), lignin (ADL) and in vitro DM digestibility (IVDMD). Cell wall constituents (NDF-ADF-ADL) and IVDMD were determined according to Goering & Van Soest (1970).

**Results and discussion** The average DM content of the evaluated maize genotypes at harvest time was of 32.2 ± 3.4 %. There were differences among the genotypes of all the evaluated variables. The interaction cultivar\*year was significant in all variables. Genotypes 3, 11, 12 y 23 of the Highland Valleys and the 14 subtropical genotypes had the highest GMY and DMY production (Table 1).

**Table 1** Comparisons of means for forage yield and nutritional value of Highland Valleys and subtropical maize cultivars, 1999-2000

Regions	Cultivar/Hybrid	DS	PH (m)	GMY (t/ha)	DMY (t/ha)	DDMY (t/ha)	% CP	% IVDMD	% NDF	% ADF	% ADL
Highlands	Ganador (11)	97	3.1	83.8	26.8	18.6	8.1	69.7	64.0	37.8	6.0
	HS2 (23)	91	2.9	89.0	28.2	19.5	7.9	69.5	60.3	36.0	5.7
	H-135 (3)	101	2.9	96.7	31.8	22.0	8.3	69.4	60.3	36.1	6.4
	VS-22 (28)	87	2.7	77.6	24.6	16.8	8.6	68.9	58.7	34.5	5.6
	ZINA-1 (10)	92	2.9	77.9	24.9	17.0	8.0	68.6	56.6	35.7	5.6
	Triunfo (12)	95	3.0	96.9	28.7	19.3	8.1	68.0	60.2	34.9	6.4
	Trueno (2)	102	2.5	70.7	22.8	14.2	7.4	62.5	64.8	38.5	6.4
Subtropical	A-791 (14)	104	2.6	87.9	28.5	17.3	7.8	60.7	66.8	37.9	5.6
	Pantera (16)	105	2.3	77.7	24.2	14.8	7.9	60.8	62.1	37.0	6.3
	Tromba (17)	99	2.5	74.4	24.6	15.0	7.5	61.2	63.5	37.7	6.8
	Tukey 0.05	4.2	0.30	16.4	5.0	3.6	1.3	7.1	7.6	4.3	2.3

The genotypes with significantly lower IVDMD were the hybrids 2, 14, 16 y 17 integrated with subtropical germplasm; they also were among the ones with a higher content of NDF and ADF. Cultivars of significantly high digestibility were 10, 11, 12, 23 y 28 with adaptability to the Highland Valleys of Mexico and those that were integrated with germoplasm of “Chalqueño.” Subtropical and Highland Valleys cultivars had equal CP content. However, among the cultivars of higher IVDMD, the 3, 11 and 23 showed a significantly higher content of FDN; this can suggest that the fibre quality of these genotypes might be better, due to composition changes and cell wall digestibility with higher hemicelluloses concentration and reduced contribution of lignified material and increased cell contents. In an in vitro study, Doane *et al.* (1997) demonstrated that a higher digestibility of NDF in maize stover was related to a higher hemicelluloses concentration, which was available for fermentation.

**Conclusion** The material with the best productive and nutritive behaviour were the hybrids H-135 and HS-2 as well as the cultivars Ganador and Triunfo of the late cycle and among the ones of the intermediate cycle the cultivar VS-22; however, the subtropical genotypes showed a better plant structure and root and stalk lodging resistance.

### References

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