The presence of genotype × environment interaction causes changes in ranking of breeding values (BV) of sires from one environment to another, which affects genetic progress. The objective was to determine the magnitude of genotype × climate interaction (G×C) for growth traits in the genetic evaluation of Braunvieh cattle. Traits studied were weaning weight (WW) and yearling weight (YW). Records provided by the Asociación Mexicana de Criadores de Ganado Suizo de Registro, were grouped based on the meteorological variables recorded nearest to the herd by the National Weather System. The CLUSTER procedure in SAS was used to classify herds into 3 climates: dry tropic (DT), wet tropic (WT) and temperate (TE). Records of WW were 5348, 4501 and 2517 animals in the pedigree. An animal model with ASReml software was used to estimate genetic parameters and to predict BVs. Bivariate analyses were carried out for pairwise combinations of climates for each growth trait. The criteria to evaluate G×C were: 1) genetic correlations (r_g) of climates for each growth trait. The criteria to evaluate G×C were:

For YW, there were 3811, 2652 and 1528 records in DT, WT and TE, respectively, with 25173 animals in the pedigree. A second evaluation of visual scores (VS22) were carried out 28 d to calculate average daily gain (ADG) and gain to feed ratio (G:F).

The visual were assigned to each animal in a within-gender comparison and the relationship among traits was evaluated by Pearson correlation. Visual scores showed moderate to high correlations with BW in both evaluations. The correlations between BW and C were 0.75 and 0.35 in VS16 and VS22, whereas with P the correlations coefficients were 0.46 and 0.29, respectively. For muscularity, the correlation with BW was 0.5 in both evaluations. Conformation score was positively correlated with DMI and ADG in both VS16 (0.47 and 0.27) and VS22 (0.33 and 0.13) and negatively with G:F in both evaluations (−0.15 and −0.19). Correlation of P with DMI was low and positive (0.25) in VS16 and nonsignificant (P > 0.05) with the rest of traits in both evaluations.

Visual evaluation of herd of birth is an important aspect of selection in growing traits in Braunvieh cattle. Traits studied were weaning weight (WW) and yearling weight (YW). Records of YW were 5348, 4501 and 2517 animals in the pedigree. The CLUSTER procedure in SAS was used to classify herds into 3 climates: dry tropic (DT), wet tropic (WT) and temperate (TE). Records of WW were 5348, 4501 and 2517 animals in the pedigree. An animal model with ASReml software was used to estimate genetic parameters and to predict BVs. Bivariate analyses were carried out for pairwise combinations of climates for each growth trait. The criteria to evaluate G×C were: 1) genetic correlations (r_g) in bivariate analyses, and 2) frequencies of coincidence (FC) in the ranking of top 25 sires. Estimates of FC between DT and WT, DT and TE, and WT and TE were −0.36, 0.84 and 0.72 for WW, and 0.23, 0.99 and 0.23 for YW, respectively. The FC between DT and WT, DT and TE, and WT and TE were 0.16, 0.92 and 0.76 for WW, and 0.60, 1.00 and 0.64 for YW, respectively. The size of r_g and FC imply the presence of G×C when compared WT with DT or TE, suggesting that genetic evaluations should be carried out separately for animals performing under wet tropical conditions.

Key Words: genotype by environment, weaning weight, Braunvieh cattle