Second, bootstrapped response function coefficients were calculated between monthly climatic data (Tmax or Tmin and P) and the residual chronology of each stand (EW, LW and total ring, Guiot, 1991). Climatic parameters were considered from August n-1 to July n for the deciduous species and from September n-1 to August n for pine. Analyses were performed using 12 monthly Tmax or Tmin and 12 P from 1961 to 2007. For the same period, response function analyses were also performed between monthly temperatures (Tmax or Tmin) and SWD indices and the residual chronology of each stand. The SWD indices were I_s from June to October (n-1 and n) and annual SWD duration (n and n-1). Analyses were thus performed using 12 monthly Tmax or Tmin and 12 SWD indices. Linear multiple regressions were finally performed between the significant climatic data or SWD indices resulting from the response function analyses and the residual chronology of each stand from 1961 to 2007. The adjusted R^2 obtained from these regressions accounted for the percent of the interannual variations in stand growth explained by climatic (T, P) or bioclimatic (T, SWD indices) models.

Third, response function analyses with only 12 regressors were performed between monthly temperatures (Tmax or Tmin) and SWD indices and the residual chronology of each stand over two periods: 1961-2007 (47 years) and the pointer years of each species (25<N<30 years). This allowed a comparison of the stand growth response for the two periods with the same number of regressors. The regressors were chosen according to the previous results of the response function analyses (methodology described in the previous paragraph). For the deciduous species, analyses were conducted using 6 monthly Tmax (August to October n-1, June to August n) and 6 SWD indices (I_s of July and August n-1, I_s from June to August n and SWD duration n). For pine, analyses were performed using 7 monthly Tmax (June and December n-1, January, February and June to August n) and 5 SWD indices (I_s of August and September n-1, I_s of August and September n and SWD duration n).

Results

Interannual growth variations

The growth of the three species responded similarly to dry years (e.g., 1964, 1976, 1996), which induced a decrease in growth (**Fig. 1**). The interannual variations were more pronounced for beech (Levene-test, $p < 0.001$). The pointer years were different between species (**Fig. 2**). Considering the total ring parameter, the proportion of pointer years was slightly higher for oak (30) than for beech (26) and pine (25) from 1961 to 2007. There were only two pointer years for beech from 1961 to 1973 because the pointer years were different between the three beech stands (data not shown). For oak, a low growth level was observed during the 7 years from 1972 to 1978, with a lack of a positive pointer year in 1975 compared to the other species. The drought in 2003 had an impact on pine, resulting in a