Plant biomass is usually assumed to be positively correlated with canopy cover. Measurements of canopy cover can now be easily and precisely made through image processing of high-resolution digital photography. This study aims to determine rapid, accurate and non-destructive ecological measurements of the aboveground biomass of selected plant species of the dry rangelands of southern Tunisia. The digital vegetation charting technique was used to estimate the canopy cover of three plant species: *Artemisia herba-alba* Asso., *Rhanterium suaveolens* Desf. and *Stipa tenacissima* L. Biomass of the selected species was also determined to develop regression models and correlation equations with the relative canopy cover. The main result was a strong correlation between canopy cover and dry biomass: coefficients of determination of 0.46 and 0.96 for *A. herba-alba* during the springs of 2014 and 2015, respectively; and correspondingly 0.9 and 0.97 for *R. suaveolens* and 0.69 and 0.97 for *S. tenacissima*. This digital charting technique offers a non-destructive, accurate and rapid means for monitoring and assessment of rangeland productivity dynamics as well as an efficient tool for developing range management strategies in dry areas.