DyBa2(Cu1-x-Zrx)3O7-δ thin films (with x = 0.00, 0.02, 0.04, and 0.06) were synthesized using the chemical solution deposition method on single crystalline LaAlO3 substrates. Effects resulting from Zr doping were investigated by means of magnetic and structural measurements. X-ray diffraction analysis demonstrated a strong c-axis orientation in the DyBa2(Cu1-x-Zrx)3O7-δ thin films, with only minor reflections due to the presence of Dy2O3 and BaZrO3 phases. Narrow transitions with ΔTc ranging from 1 to 2 K for samples with x = 0.00 and 0.06, respectively, were observed in ac magnetic susceptibility curves, where the nondoped sample demonstrated the highest T onsetc of 91.7 K compared to the Zr-doped samples. Critical current densities Jc of the thin films were obtained from magnetization loop measurements with applied magnetic fields up to 6 T and by employing the Bean model. The samples doped with 4% Zr exhibited the highest Jc value (Jc = 3.5 MA/cm2, self-field, 77 K) in the low field range and we, in general, observed that Zr-doped films demonstrated higher values compared to the pure sample. Pinning force plots (Fp versus B) reveal a significant improvement over the magnetic field range investigated of the maximum pinning force for Zr-doped samples. We found FMaxp = 1.7 GN/m3 and 3.8 GN/m3 for pure and 6% Zr samples, respectively. Analysis based on the Dew-Hughes model shows that normal surface pinning is the dominating pinning mechanism.