Barley sorting is an important step for selecting grain of required quality for malting prior to brewing. However, brewing with unmalted barley with added enzymes has been thoroughly proven, raising the question of whether traditional sorting for high-quality malting-barley is still necessary. To gain more insight on this, we examine realtime viscosity of sorted-out and unsorted barley during downscaled mashing with added enzymes in comparison with malting-quality sorted barley. A rapid visco analyser was used to simulate brewery mashing process at lab scale together with two commercial enzymes (Ondea®-Pro and Cellic®-CTec2). During downscaled mashing, viscosity profile of sorted-out barley was markedly different from others, irrespective of enzyme type, whereas a small difference was observed between the sorted and unsorted barley. Furthermore, whilst sorted-out barley generated lowest sugar-concentration, unsorted and sorted barley resulted in higher sugar-content, regardless of the enzyme used. In terms of filterability, the Ondea®-Pro treatment resulted in significantly lower-turbidity and smaller particle-size compared to Cellic®-CTec2; however, this effect was observed in sorted and unsorted barley but not in sorted-out barley. Consequently, we find that unsorted barley demonstrates great potential for brewing with added enzymes and its use may help to improve sustainability of the brewing process.