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We consider some rational dilation problems for hypo-Dirichlet algebras. Sample results: 1) if  $S, T$  are commuting contractive operators on Hilbert space satisfying  $S^2 = T^2$ , then the pair  $(S, T)$  has a commuting unitary dilation  $(U, V)$  such that  $U^2 = V^2$ . 2) However, if instead  $S^2 = T^3$ , a unitary dilation satisfying  $U^2 = V^3$  need not exist. The first theorem may be seen as a limiting case of Agler's rational dilation theorem for the annulus; the counterexample for the second statement shares some features with the counterexample to rational dilation on a two-holed domain, constructed by Dritschel and McCullough. (Received August 26, 2013)