

Article title	Application timing of urea supergranules for climate-resilient maize cultivars grown in Northern Ghana
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Abstract	<p>Agronomic effectiveness of urea deep placement (UDP) technology for upland maize production, using urea supergranules (USG) as the supplemental nitrogen (N) source, is affected by USG application time. In field studies conducted in six locations in northern Ghana during 2015–2017 growing seasons, we determined appropriate USG application time(s) for climate-resilient maize (early maturing and medium-maturing drought-tolerant) varieties for increased productivity. USG was applied at a depth of 7-10 cm on either 2, 3, 4, 5, or 6 weeks after planting (WAP). For the medium-maturing maize variety, across all locations and in the three growing seasons, applying USG produced an average grain yield of 4.5 t ha⁻¹, 4.4 t ha⁻¹ and, 4.2 t ha⁻¹ on 2, 3 and 4 WAP, respectively. Applying USG on 5 and 6 WAP produced an average grain yield of 3.4 t ha⁻¹ and 2.8 t ha⁻¹, respectively. For the early-maturing variety, average grain yield when USG was applied on 2 WAP was 4.1 t ha⁻¹, and 4.0 t ha⁻¹ on 3 WAP. Late applications produced an average grain yield of 2.4 t ha⁻¹, and 1.9 and 1.7 t ha⁻¹ on 4, 5, and 6 WAP, respectively. Harvest index, recovery of applied N, and N use efficiency followed similar pattern as grain yields. From the combined results, we conclude that, barring adverse environmental conditions, applying USG as supplemental N within 3 WAP for the early-maturing maize varieties, and 4 WAP for the medium-maturing maize varieties could result in greater agronomic benefits than when applied later.</p>
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