

## Variation of Tannin Content as Affected by Cultivation Environment in Sorghum 'Donganme'

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### [Introduction]

Sorghum is a rich source of various phytochemicals including phenolic acids that have potential to significantly benefit human health. Seed, when grown in good conditions produces high quality crops and seed which have application in food science and human nutrition as a high antioxidant food additive, natural food colorant, and natural food preservative. Phytochemical production may be induced not only by genotype but also by a number of environmental factors including temperature, precipitation and solar radiation. The objective of this study was to determine the effect of planting dates and harvesting stages on the grain characteristics and tannin concentrations of 'Donganme,' a grain sorghum variety developed to produce strong antioxidant activity with the high-tannin.

### [Material and Methods]

'Donganme' was grown in three different locations; Miryang (35° 29' 31.7" N 128° 44' 31.0" E), Wonju (37° 12' 55.9" N, 128° 05' 31.4" E) and Paju (37° 58' 9.6" N, 126° 56' 54.7" E) for four times; May 5, May 25, June 15, July 5. Each planted fraction was harvested five times, 35, 40, 45, 50 and 55 days, after the head shooting date, respectively. Plants were planted in a 60cm by 20cm space/area with fertilizer level of 100:70:80 N-P-K kg/ha. The content of tannin was measured using the modified vanillin assay and the kernel colour was measured with a Minolta CM-3700 spectrophotometer (Konica Minolta, Osaka). The data were subjected to DMRT analysis using R version 3.2.2

### [Results and Conclusion]

The results showed that significant differences existed between the growth period and tannin. The sorghum harvested at 35 days after head shooting had the higher tannin content in all planting times and the tannin content was increased as the planting date was delayed. So the sorghum grown in late planting dates (June 5) had highest tannin content (214.8 mg CE/g) at early harvesting (35 days) while late planting gave the low grain yield (2.6 ton/ha). It means that low temperature and solar radiation affect on those traits. To produce high quality grain from sorghum the relation between the yield and nutrition components must be considered simultaneously (i.e., Sorghum produced the highest tannin when planted in June 5 and harvested at 45 days after head shooting (16 kg/10a))

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