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Observations of soil moisture and infiltrability in contour-aligned, banded chenopod shrubland at Fowlers Gap, arid western NSW, Australia.

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Speculation abounds concerning the drivers of spatial patterning in dryland vegetation, and many numerical analyses have been built with little use of field evidence for parameterisation or validation. In fact, studies of soil moisture distribution, the most commonly hypothesised driver of pattern formation, are uncommon. Here, soil infiltrability and soil moisture data are presented from a banded vegetation community in arid western NSW Australia. The site had received 40 mm of rain in one day a week prior to field measurement. This is an exceptional rain event for this region, and provided the opportunity to observe resulting distributions of soil moisture within various mosaics, including contour-aligned groves and intergroves in chenopod shrubland. Results taken at 2 m intervals across many cycles of the repeating banded pattern show that near-surface (6 cm) soil moisture is relatively constant, except in lower intergroves, which were drier. Patterns of soil infiltrability by cylinder infiltrometer follow the same pattern, with lowest values at the same locations as the soil moisture minima. Locally high soil infiltrabilities occur in both grove and intergrove, but low values are restricted to intergroves. These results suggest that any runoff-runon system operating at the site is driven largely from the intergroves, where high bulk density, hydrophobic biological soil crusts, and mantles of small stones with associated vesicular horizons, limit water entry. If this is so, it suggests that attention must be paid to intergrove processes, which may be more significant that plant facilitation within groves. Model developments will thus need to address the evolution of low infiltrability in intergroves in parallel with any high infiltrability within groves.