In coral islands of Okinawa (Fig. 1), Japan, beef cattle production had been carried for a long time by traditional grazing system. So, it had been low grassland and cattle production (Fig. 2).

A large scale of grassland development was started from 1984 by "Process 1" using "Improved stabilizer", improved road stabilizer, for digging 30cm depth against hard coral-bedrock of Ryukyu Limestone (upheaval).

In "Process 2", “Stone crusher” was used instead of man-hand picking stones on surface after working improved stabilizer.

Methods

- Investigation of stone distribution each 10cm soil layer and grass root (March, 2013) in grassland after Processes 1 and 2 (Kuroshima Island).
- Investigation of stones on grassland surface (March, 2013) after re-improvement of old grassland was worked by stone crusher only in 2009 (Kobama Island).

Results

- Stone content was 11.0% in Process 1 and 9.3% in Process 2. Stone content of 10~20 cm and 20~30 cm layers were almost similarly, however, the different in the top layer was obviously measured 1.9% in Process 2 against 6.2% in Process.
- Grass root weight (dry) in Process 1 was 57.8 g against 41.2 g in Process 2. Averaged percentage in Process 1 was 91.1% in 0~10 cm layer, being slightly large against 82.3% in Process 2. However, in 10~20 cm and 20~30 cm layers, the average percentages in Process 2 indicated larger than in Process 1.

- Stones on grassland after working stone crusher up to 30cm depth were in no small way found. They were dug up from the bottom layer, where stone crusher forced stones down by conical bits.

Conclusion

Re-improvement method of old pasture grassland is recommended to work the stone crusher up to 10 cm depth (desirable, maximum 15 cm), to make fine soil with less stones in a top layer for better grass growing.