

Original Research Article

Carbon dioxide equivalent carbon stock under wheat and eucalyptus based agroforestry system in central India

Abstract

An experiment organised to evaluation of carbon dioxide equivalent carbon stock or sequestration by wheat, weed and eucalyptus tree under agroforestry system with different weed control treatments. The two year experiment performed during 2016-17 and 2017-18 a well managed farmer field of block shahpura village majitha, Jabalpur with supervision of department of forestry jnkvv Jabalpur. The result revealed that the wheat crop found total CO₂ equivalent C stock was significantly higher under hand weeding at 30 DAS 15.62 and 14.07 t/ha during 2016-17 and 2017-18, respectively over weedy check. The pooled data in wheat crop showed that weed management practices was found higher total CO₂ equivalent C stock range from (10.87 to 14.85 t/ha) over weedy check (9.68 t/ha) under wheat-*Eucalyptus tereticornis* based agroforestry system. The total CO₂ equivalent C stock in weed was significantly higher under weedy check (4.31 to 4.37 t/ha during 2016-17 and 2017-18, respectively) over hand weeding at 30 DAS (0.57 and 0.18 t/ha during both year). The pooled data showed that the average total CO₂ equivalent C stock in weed was significantly higher under weedy check (4.34 t/ha) over hand weeding 30 DAS (0.30 t/ha). The weed management practices was found lower CO₂ equivalent C stock range from (0.38 to 1.80 t/ha) under wheat-*Eucalyptus tereticornis* based agroforestry system. The total CO₂ equivalent C stock of eucalyptus tree was found range between 195.11 to 204.61 t/ha and 248.39 to 258.78 t/ha was found during 2016-17 and 2017-18, respectively under wheat-*Eucalyptus tereticornis* based agroforestry system. The statistical analysis of the pooled data showed that the CO₂ equivalent C stock in eucalyptus tree varied from 224.18 to 230.86 t/ha was found under wheat-*Eucalyptus tereticornis* based agroforestry system. CO₂ equivalent C stock of agroforestry system was found range between 63.06 to 66.93 t/ha and 62.48 to 66.01 t/ha during 2016-17 and 2017-18 under wheat-*Eucalyptus tereticornis* based agroforestry system. The pooled data showed that total CO₂ equivalent C stock in agroforestry system was found varied from 62.77 to 66.47 t/ha under wheat-*Eucalyptus tereticornis* based agroforestry system.

Key Words – Carbon stock, wheat, weeds, Eucalyptus, carbon dioxide

Introduction

The increasing atmospheric carbon dioxide are one of the important region to increase global warming. The every component of the earth has capacity to store and release carbon in the earth. In the terrestrial ecosystem the every component such as tree, crop and other vegetation have capacity to store atmospheric carbon though

photosynthesis and other process. The agroforestry system consist of three component such as tree crop and animal. These component play important role to store atmospheric carbon and released it. Eucalyptus tree is currently highly acceptable by farmers due to fast growing and short rotation or maturity period and various uses by industries. The crop are growing under tree canopy is increase the overall productivity of land area and reduce the risk of failure of one crop. Wheat is growing in different region for food purpose and it is one of the income source of the farmers under crop cultivation. For increasing productivity of wheat crop, the management practices such as weed management, insect pest management is essential practices adopted by farmers. Here the experiment was conducted to know about the how much tree crop and weeds, the agroforestry vegetation are store carbon dioxide equivalent carbon stock under wheat and *Eucalyptus tereticornis* based agroforestry system with different weed management practices.

Material and Methods

The experiment was conducted at farmer field of block shahpura village majitha, Jabalpur with supervision of department of forestry Jnkvv Jabalpur during 2016-17 and 2017-18 with 4 and 5 year old *Eucalyptus tereticornis* trees spacing of 3x1.5 m understory with wheat crop in agroforestry system and also applied with different weed control treatments.

Data collection and analysis

This study was undertaken to obtained agroforestry system total carbon stock the all material sample was collected and convert into dry matter content and convert into dry biomass per hectare and dry biomass was converted into carbon by ash method. To determine carbon dioxide sequestration potential or equivalent carbon stock by trees, crops and weeds the biomass carbon stock was multiplied 3.67 factor for all species by the formula suggested by Rajput (2010). Factor 3.67 were found by the carbon and oxygen molecule atomic weight ratio such as CO₂ have one molecule of carbon and 2 molecules of oxygen

The Carbon atomic weight is 12 and Oxygen atomic weight of is 15.9 so the total atomic weight of carbon dioxide is 43.9 [C(12) + 2 O (15.9+15.9) = 43.9] and the ratio of CO₂ to C is $43.9/12 = 3.67$

$$\text{Carbon dioxide equivalent Carbon stock} = \text{carbon Stock} \times 3.67$$

Result and discussion

The carbon pool of crops and trees were converted into carbon dioxide equivalent C stock, the significant variation was observed under agroforestry system for carbon dioxide sequestration potential.

Carbon dioxide equivalent C stock by wheat

The significantly maximum aboveground CO₂ equivalent C stock of wheat crop (Table 1) was noticed under hand weeding at 30 DAS (12.56 and 11.32 t/ha) over weedy check during both the year. The different weed control treatments show higher CO₂ equivalent carbon stock varied from (9.31 to 11.21 t/ha) during first year and (8.19 to 9.98 t/ha) during second year. The statistical analysis of the pooled data also reported the same pattern of aboveground CO₂ equivalent C stock under wheat-*Eucalyptus tereticornis* based agroforestry system. The belowground CO₂ equivalent C stock was significantly higher under hand weeding at 30 DAS (3.06 and 2.75 t/ha) during both the year. The total CO₂ equivalent C stock was significantly higher under hand weeding at 30 DAS (15.62 and 14.07 t/ha) over weedy check during both the year. The statistical analysis of the pooled data reported that the average CO₂ equivalent C stock of wheat crop was significantly higher under hand weeding at 30 DAS (14.85 t/ha) over weedy check (9.68 t/ha). The weed management practices were found higher total CO₂ equivalent C stock range from (10.87 to 13.16 t/ha) over weedy check (9.68 t/ha) under wheat-*Eucalyptus tereticornis* based agroforestry system. The higher above and belowground CO₂ equivalent C stock was noticed under weedy check plot because the higher growth and biomass production was found under this treatment. Thevathasan and Gorden (2004) also concluded that, the annual CO₂ equivalent carbon stock in a hybrid poplar intercropping field was four times higher as compared to sole agriculture cropping fields. Higher CO₂ equivalent carbon stock in intercropping system compared to sole cropping system has supported in case of *Pauownia*+winter wheat (Zhou and Wang, 1997) and poplar based system (Peichlet *et al.*, 2006).

Table 1 Carbon dioxide equivalent C stock of wheat crop under- *Eucalyptus tereticornis* based agroforestry systems

| Treatment | CO ₂ equivalent C stock (t/ha) | | | | | | | | |
|--|--|---------|--------|-------------|---------|--------|---------|---------|--------|
| | Aboveground | | | Belowground | | | Total | | |
| | 2016-17 | 2017-18 | pooled | 2016-17 | 2017-18 | pooled | 2016-17 | 2017-18 | pooled |
| T ₁ - 2, 4-D @ 0.5 lit/ha | 10.78 | 9.11 | 9.94 | 2.62 | 2.20 | 2.41 | 13.40 | 11.32 | 12.36 |
| T ₂ - Metribuzin @ 0.250 Kg ha ⁻¹ | 10.84 | 9.30 | 10.07 | 2.63 | 2.25 | 2.44 | 13.47 | 11.55 | 12.51 |
| T ₃ - Butachlor @ 1 lit/ha | 9.31 | 8.20 | 8.75 | 2.27 | 1.98 | 2.12 | 11.57 | 10.18 | 10.87 |
| T ₄ - Clodinafop-propargyl @ 0.140 kg ha ⁻¹ | 11.21 | 9.98 | 10.60 | 2.73 | 2.41 | 2.57 | 13.94 | 12.39 | 13.16 |
| T ₅ - 2, 4-D @ 0.5 lit/ha <i>fb</i> metribuzin @ 0.250 Kg ha ⁻¹ | 10.31 | 9.36 | 9.84 | 2.51 | 2.26 | 2.39 | 12.82 | 11.62 | 12.22 |
| T ₆ - 2, 4-D @ 0.5 lit/ha <i>fb</i> butachlor @ 1 lit/ha | 10.00 | 9.01 | 9.51 | 2.45 | 2.19 | 2.32 | 12.44 | 11.21 | 11.82 |
| T ₇ - Metribuzin @ 0.250 Kg ha ⁻¹ <i>fb</i> butachlor @ 1 lit/ha | 9.72 | 8.19 | 8.96 | 2.37 | 2.00 | 2.19 | 12.10 | 10.18 | 11.14 |
| T ₈ - 2, 4-D @ 0.5 lit/ha + hand weeding at 30 DAS | 10.64 | 9.22 | 9.93 | 2.59 | 2.24 | 2.42 | 13.24 | 11.46 | 12.35 |
| T ₉ - Hand Weeding at 30 DAS | 12.56 | 11.32 | 11.94 | 3.06 | 2.75 | 2.91 | 15.62 | 14.07 | 14.85 |
| T ₁₀ - Weedy check | 8.66 | 6.90 | 7.78 | 2.13 | 1.66 | 1.90 | 10.79 | 8.56 | 9.68 |
| SEm± | 0.22 | 0.44 | 0.24 | 0.05 | 0.11 | 0.06 | 0.27 | 0.55 | 0.30 |
| CD (P=0.05) | 0.64 | 1.30 | 0.69 | 0.15 | 0.32 | 0.17 | 0.79 | 1.61 | 0.86 |

Carbon dioxide equivalent C stock weeds biomass

Aboveground CO₂ equivalent C stock (t/ha)

The significantly higher aboveground CO₂ equivalent C stock was noticed under weedy check (3.48 and 3.55 t/ha during 2016-17 and 2017-18, respectively) over hand weeding at 30 DAS (0.46 and 0.15 t/ha during 2016-17 and 2017-18, respectively). The pooled data showed that aboveground CO₂ equivalent C stock in weeds was significantly higher under weedy check (3.52 t/ha) over hand weeding at 30 DAS (0.31 t/ha) under wheat-*Eucalyptus tereticornis* based agroforestry system (Table 2).

Belowground CO₂ equivalent C stock (t/ha)

The belowground CO₂ equivalent C stock was significantly higher under weedy check (0.83 and 0.82 t/ha during 2016-17 and 2017-18, respectively) over hand weeding 30 DAS (0.11 and 0.04 t/ha during 2016-17 and 2017-18, respectively). The pooled analyzed data of belowground CO₂ equivalent C stock in weed was significantly lower under hand weeding at 30 DAS (0.07 t ha⁻¹) over weedy check (0.83 t/ha) (Table 2).

Total CO₂ equivalent C stock by weed (t/ha)

The total CO₂ equivalent C stock in weed was significantly higher under weedy check (4.31 to 4.37 t/ha during 2016-17 and 2017-18, respectively) over hand weeding at 30 DAS (0.57 and 0.18 t/ha during 2016-17 and 2017-18, respectively). The pooled data showed that the average total CO₂ equivalent C stock in weed was significantly higher under weedy check (4.34 t/ha) over hand weeding 30 DAS (0.30 t/ha). The weed management practices was found lower CO₂ equivalent C stock range from (0.38 to 1.80 t/ha) over weedy check under wheat-*Eucalyptus tereticornis* based agroforestry system (Table 2).

Table 2. Carbon dioxide equivalent C stock potential of weeds under- *Eucalyptus tereticornis* based agroforestry systems

| Treatment | CO ₂ equivalent C stock (t/ha) | | | | | | | | |
|--|---|---------|--------|-------------|---------|--------|---------|---------|--------|
| | Aboveground | | | Belowground | | | Total | | |
| | 2016-17 | 2017-18 | pooled | 2016-17 | 2017-18 | pooled | 2016-17 | 2017-18 | pooled |
| T ₁ - 2, 4-D @ 0.5 lit/ha | 0.86 | 0.77 | 0.81 | 0.21 | 0.18 | 0.20 | 1.07 | 0.95 | 1.01 |
| T ₂ - Metribuzin @ 0.250 Kg ha ⁻¹ | 1.17 | 0.89 | 1.03 | 0.28 | 0.21 | 0.25 | 1.46 | 1.10 | 1.28 |
| T ₃ - Butachlor @ 1 lit/ha | 1.64 | 1.23 | 1.44 | 0.39 | 0.29 | 0.34 | 2.03 | 1.52 | 1.77 |
| T ₄ - Clodinafop-propargyl @ 0.140 kg ha ⁻¹ | 1.65 | 1.26 | 1.46 | 0.40 | 0.30 | 0.35 | 2.05 | 1.56 | 1.80 |
| T ₅ - 2, 4-D @ 0.5 lit/ha <i>fb</i> metribuzin @ 0.250 Kg ha ⁻¹ | 0.79 | 0.70 | 0.75 | 0.19 | 0.16 | 0.18 | 0.99 | 0.86 | 0.92 |
| T ₆ - 2, 4-D @ 0.5 lit/ha <i>fb</i> butachlor @ 1 lit/ha | 1.37 | 1.04 | 1.20 | 0.33 | 0.25 | 0.29 | 1.70 | 1.28 | 1.49 |
| T ₇ - Metribuzin @ 0.250 Kg ha ⁻¹ <i>fb</i> butachlor @ 1 lit/ha | 1.64 | 1.32 | 1.48 | 0.39 | 0.31 | 0.35 | 2.03 | 1.63 | 1.83 |
| T ₈ - 2, 4-D @ 0.5 lit/ha + hand weeding at 30 DAS | 0.86 | 0.79 | 0.83 | 0.21 | 0.18 | 0.20 | 1.07 | 0.98 | 1.02 |
| T ₉ - Hand Weeding at 30 DAS | 0.46 | 0.15 | 0.31 | 0.11 | 0.04 | 0.07 | 0.57 | 0.18 | 0.38 |
| T ₁₀ - Weedy check | 3.48 | 3.55 | 3.52 | 0.83 | 0.82 | 0.83 | 4.31 | 4.37 | 4.34 |
| SEm± | 0.15 | 0.12 | 0.10 | 0.04 | 0.03 | 0.02 | 0.19 | 0.15 | 0.12 |
| CD (P=0.05) | 0.44 | 0.36 | 0.27 | 0.10 | 0.08 | 0.06 | 0.54 | 0.43 | 0.33 |

Carbon dioxide equivalent C stock from eucalyptus tree biomass (t/ha)

Aboveground CO₂ equivalent C stock (t/ha)

The aboveground CO₂ equivalent C stock in eucalyptus tree was increased with increasing age. During first year at the age of 4th year the aboveground CO₂ equivalent C stock in eucalyptus tree range between 161.95 to 154.68 t/ha was found and at the age of 5th year During second year of experiment aboveground CO₂ equivalent C stock of eucalyptus tree was ranged from 197.86 to 209.70 t/ha was found under wheat-*Eucalyptus tereticornis* based agroforestry system.

The pooled data showed that the average aboveground carbon sequestration potential of eucalyptus tree varied from 178.24 to 185.01 t/ha was found under agroforestry system (Table 3).

Belowground CO₂ equivalent C stock(t/ha)

The belowground CO₂ equivalent C stock of eucalyptus tree range between 40.94 to 42.66 t/ha and from 49.23 to 52.74 t/ha was found during first and second year of experiment and the pooled mean of two year showed that belowground CO₂ equivalent C stock in eucalyptus tree varied from 45.20 to 46.66 t/ha was found under wheat-*Eucalyptus tereticornis* based agroforestry system (Table 3).

Total CO₂ equivalent C stock by tree (t/ha)

During first year (2016-17) the total CO₂ equivalent C stock of eucalyptus tree range between 195.11 to 204.61 t ha⁻¹ and ranged from 248.39 to 258.78 t/ha was found during second year (2017-18) under wheat-*Eucalyptus tereticornis* based agroforestry system.

The statistical analysis of the pooled data showed that the CO₂ equivalent C stock in eucalyptus tree varied from 224.18 to 230.86 t/ha was found under wheat-*Eucalyptus tereticornis* based agroforestry system (Table 3).

Table 3. Carbon dioxide equivalent C stock in eucalyptus tree under- *Eucalyptus tereticornis* based agroforestry systems

| Treatment | CO ₂ equivalent C stock (t/ha) | | | | | | | | |
|--|---|---------|--------|-------------|---------|--------|---------|---------|--------|
| | Aboveground | | | Belowground | | | Total | | |
| | 2016-17 | 2017-18 | pooled | 2016-17 | 2017-18 | pooled | 2016-17 | 2017-18 | pooled |
| T ₁ - 2, 4-D @ 0.5 lit/ha | 154.68 | 206.31 | 180.49 | 40.44 | 50.74 | 45.59 | 195.11 | 257.05 | 226.08 |
| T ₂ - Metribuzin @ 0.250 Kg ha ⁻¹ | 157.58 | 212.44 | 185.01 | 41.21 | 52.08 | 46.64 | 198.79 | 264.52 | 231.65 |
| T ₃ - Butachlor @ 1 lit/ha | 156.68 | 202.46 | 179.57 | 41.16 | 51.47 | 46.31 | 197.84 | 253.93 | 225.88 |
| T ₄ - Clodinafop-propargyl @ 0.140 kg ha ⁻¹ | 156.26 | 200.23 | 178.24 | 40.94 | 50.94 | 45.94 | 197.20 | 251.17 | 224.18 |
| T ₅ - 2, 4-D @ 0.5 lit/ha <i>fb</i> metribuzin @ 0.250 Kg ha ⁻¹ | 158.49 | 202.79 | 180.64 | 41.56 | 52.74 | 47.15 | 200.05 | 255.53 | 227.79 |
| T ₆ - 2, 4-D @ 0.5 lit/ha <i>fb</i> butachlor @ 1 lit/ha | 161.54 | 201.49 | 181.51 | 42.41 | 51.37 | 46.89 | 203.95 | 252.86 | 228.40 |
| T ₇ - Metribuzin @ 0.250 Kg ha ⁻¹ <i>fb</i> butachlor @ 1 lit/ha | 157.13 | 209.70 | 183.42 | 40.99 | 52.02 | 46.51 | 198.12 | 261.73 | 229.92 |
| T ₈ - 2, 4-D @ 0.5 lit/ha + hand weeding at 30 DAS | 157.31 | 202.72 | 180.02 | 41.17 | 49.23 | 45.20 | 198.48 | 251.95 | 225.22 |
| T ₉ - Hand Weeding at 30 DAS | 160.71 | 207.69 | 184.20 | 42.22 | 51.10 | 46.66 | 202.94 | 258.78 | 230.86 |
| T ₁₀ - Weedy check | 161.95 | 197.86 | 179.91 | 42.66 | 50.54 | 46.60 | 204.61 | 248.39 | 226.50 |
| SEm± | 3.89 | 4.15 | 2.81 | 1.09 | 1.25 | 0.82 | 4.98 | 5.02 | 3.49 |
| CD (P=0.05) | 11.37 | 12.12 | 7.98 | 3.19 | 3.65 | 2.32 | 14.54 | 14.64 | 9.91 |

Carbon dioxide equivalent C stock from agroforestry system (t/ha)

Aboveground CO₂ equivalent C stock in agroforestry system (t/ha)

The aboveground CO₂ equivalent C stock in agroforestry vegetation was found range between 50.12 to 53.21 t/ha during first year (2016-17) and second year (2017-18) aboveground CO₂ equivalent C stock in agroforestry system ranged from 49.92 to 53.00 t/ha was found. The pooled data showed that the higher aboveground CO₂ equivalent C stock in agroforestry system was found under hand weeding at 30 DAS (53.10 t/ha) over all the weed control treatment due to higher biomass. The aboveground CO₂ equivalent C stock in agroforestry system varied from 50.02 to 53.10 t/ha under wheat-*Eucalyptus tereticornis* based agroforestry system (Table 4).

Belowground CO₂ equivalent C stock (t/ha)

During first year the belowground CO₂ equivalent C stock in agroforestry system range between 12.95 to 13.72 t/ha was found and During second year belowground CO₂ equivalent C stock in agroforestry system ranged from 12.27 to 13.01 t/ha was found under wheat-*Eucalyptus tereticornis* based agroforestry system (Table 4).

The pooled data showed that the average belowground CO₂ equivalent C stock varied from 12.68 to 13.37 t/ha was found under wheat-*Eucalyptus tereticornis* based agroforestry system (Table 4).

Total CO₂ equivalent C stock in agroforestry system (t/ha)

The total CO₂ equivalent C stock in agroforestry system was found higher in hand weeding 30 DAS (66.93 t/ha and 66.01 t/ha during both of the year) over rest of the weed control treatment. CO₂ equivalent C stock was found range between 63.06 to 66.93 t/ha and 62.48 to 66.01 t/ha during 2016-17 and 2017-18 under wheat-*Eucalyptus tereticornis* based agroforestry system (Table 4).

The pooled data showed that total CO₂ equivalent C stock in agroforestry system was found varied from 62.77 to 66.47 t/ha under wheat-*Eucalyptus tereticornis* based agroforestry system (Table 4). Thevathasan and Gorden (2004) also concluded that, the annual CO₂ equivalent carbon stock in a hybrid poplar intercropping field was four times higher as compared to sole agriculture cropping fields. Higher CO₂ equivalent carbon stock in intercropping system compared to sole cropping system has supported

in case of Pauronia+winter wheat (Zhou and Wang, 1997) and poplar based system (Peichlet *et al.*, 2006). The results of present study was also confirm with the findings Mangalassery *et al.* (2014), Prasad *et al.* (2012), Rijviet *et al.* (2012), Swamy and Mishra (2014) and Chauhan *et al.* (2015).

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Table 4. Carbon dioxide equivalent C stock in wheat, weeds and eucalyptus tree under agroforestry system

| Treatment | CO ₂ equivalent C stock from agroforestry system (t/ha) | | | | | | | | |
|---|--|---------|--------|-------------|---------|--------|---------|---------|--------|
| | Aboveground | | | Belowground | | | Total | | |
| | 2016-17 | 2017-18 | Pooled | 2016-17 | 2017-18 | pooled | 2016-17 | 2017-18 | Pooled |
| T ₁ - 2, 4-D @ 0.5 lit/ha | 50.30 | 51.14 | 50.72 | 12.94 | 12.53 | 12.74 | 63.24 | 63.67 | 63.46 |
| T ₂ - Metribuzin @ 0.250 Kg ha ⁻¹ | 51.41 | 52.68 | 52.04 | 13.22 | 12.88 | 13.05 | 64.62 | 65.56 | 65.09 |
| T ₃ -Butachlor @ 1 lit/ha | 50.12 | 49.92 | 50.02 | 12.95 | 12.56 | 12.75 | 63.06 | 62.48 | 62.77 |
| T ₄ - Clodinafop-propargyl @ 0.140 kg ha ⁻¹ | 51.92 | 51.29 | 51.60 | 13.36 | 12.90 | 13.13 | 65.28 | 64.18 | 64.73 |
| T ₅ - 2, 4-D @ 0.5 lit/ha fb metribuzin @ 0.250 Kg ha ⁻¹ | 50.73 | 50.61 | 50.67 | 13.09 | 12.97 | 13.03 | 63.82 | 63.59 | 63.70 |
| T ₆ - 2, 4-D @ 0.5 lit/ha fb butachlor @ 1 lit/ha | 51.75 | 50.35 | 51.05 | 13.38 | 12.71 | 13.05 | 65.13 | 63.06 | 64.09 |
| T ₇ - Metribuzin @ 0.250 Kg ha ⁻¹ fb butachlor @ 1 lit/ha | 50.65 | 51.44 | 51.05 | 13.01 | 12.71 | 12.86 | 63.66 | 64.16 | 63.91 |
| T ₈ - 2, 4-D @ 0.5 lit/ha + hand weeding at 30 DAS | 50.83 | 50.56 | 50.69 | 13.10 | 12.27 | 12.68 | 63.92 | 62.83 | 63.38 |
| T ₉ - Hand Weeding at 30 DAS | 53.21 | 53.00 | 53.10 | 13.72 | 13.01 | 13.37 | 66.93 | 66.01 | 66.47 |
| T ₁₀ - Weedy check | 52.63 | 50.01 | 51.32 | 13.63 | 12.59 | 13.11 | 66.26 | 62.61 | 64.43 |
| SEm± | 0.97 | 0.80 | 0.62 | 0.27 | 0.26 | 0.18 | 1.24 | 0.98 | 0.78 |
| CD (P=0.05) | 2.84 | 2.33 | 1.77 | 0.79 | 0.75 | 0.52 | 3.62 | 2.86 | 2.22 |

Conclusion

The agroforestry system play vital role to absorb atmospheric carbon dioxide and stored in different component. The agroforestry system was pooled higher carbon dioxide equivalent carbon stock due to higher biomass potential of more than one component such as crop, weed and trees than the solo cropping pattern. The pooled mean of two year experiment total CO₂ equivalent C stock in agroforestry system was found varied from 62.77 to 66.47 t/ha under wheat-*Eucalyptus tereticornis* based agroforestry system with different weed control treatment.

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