

Phase VIII Status Report

On

Comprehensive Report of Kc for Sesame, *rabi* Gram and Summer Fodder Bajra

(First Year)

in

“Determination of Crop Coefficients for Major Crops by Lysimetric Studies”



at

Mahatma Phule Krishi Vidyapeeth, Rahuri

Submitted to

**Nanaji Deshmukh Krushi Sanjeevani Prakalp (PoCRA),
Mumbai**

Title of the project : Determination of Crop Coefficients for Major Crops by Lysimetric Studies

Location : CAAST-CSAWM Climate Smart Research Block and Experimental Field of AICRP on IWM, Mahatma Phule Krishi Vidyapeeth, Rahuri

Duration : 2020-2024

Total Outlay : Rs. 31.43 Lakhs (Rs. Thirty one lakh fourty three thousand only)

Principal Investigator : Dr. A. A. Atre, Professor and Head, Deptt. of SWCE, Dr. ASCAE&T, MPKV, Rahuri

Co-Principal Investigator : Dr. M. G. Shinde, Professor of SWCE, Dept. of Agril. Engg., MPKV, Rahuri
: Dr. S. A. Kadam, Associate Professor of IDE, Dept. of Agril. Engg., MPKV, Rahuri

Coordinator for the project for three universities (MPKV, Rahuri; Dr. PDKV, Akola and VNMKV, Parbhani) : Dr. S. D. Gorantiwar, Director of Research and Head, Dept. of Agril. Engg., MPKV, Rahuri

1. Comparison of Developed Kc and FAO-56 Kc for Gram

Stage wise crop coefficients for *rabi* gram determined from first year experiment are compared with stage wise crop coefficients derived from FAO-56. Details are as given below.

Details of the experiment:

- Date of Sowing: 14th December, 2021
- Date of Harvesting: 04th April, 2022
- Variety: Phule Vikram

Comparison of Local Kc and FAO-56 Kc:

Kc values developed from Lysimetric study during crop growth period are higher than those derived from FAO-56 for all crop stages. Values of crop coefficients for initial, development, mid- and end-season growth period are given in Table 1.1. Kc curve developed from local and FAO-56 Kc values are shown in Figure 1.1.

Table 1.1 Stage wise Developed Kc and FAO-56 Kc for *rabi* Gram

Growth Stage	Duration (days)	Developed Kc	FAO-56 Kc
Initial	20	0.66	0.4
Development	35	1.05	0.7*
Mid-season	35	1.20	1.0
End-season	20	0.68	0.35

*Average of initial and mid-season Kc values as three Kc values for initial, mid- and end-season are given in FAO-56

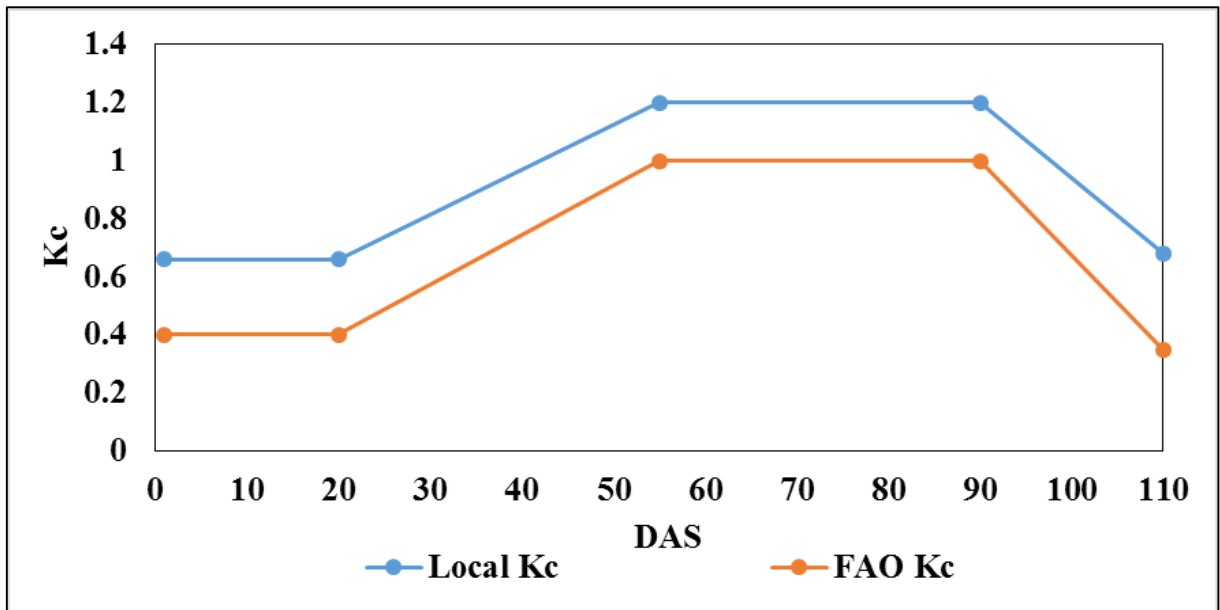


Figure 1.1: Comparison of local and FAO-56 Kc

Curve of Daily Kc values estimated using polynomial equation developed for *rabi* Gram from first year experiment is shown in the Figure 1.2.

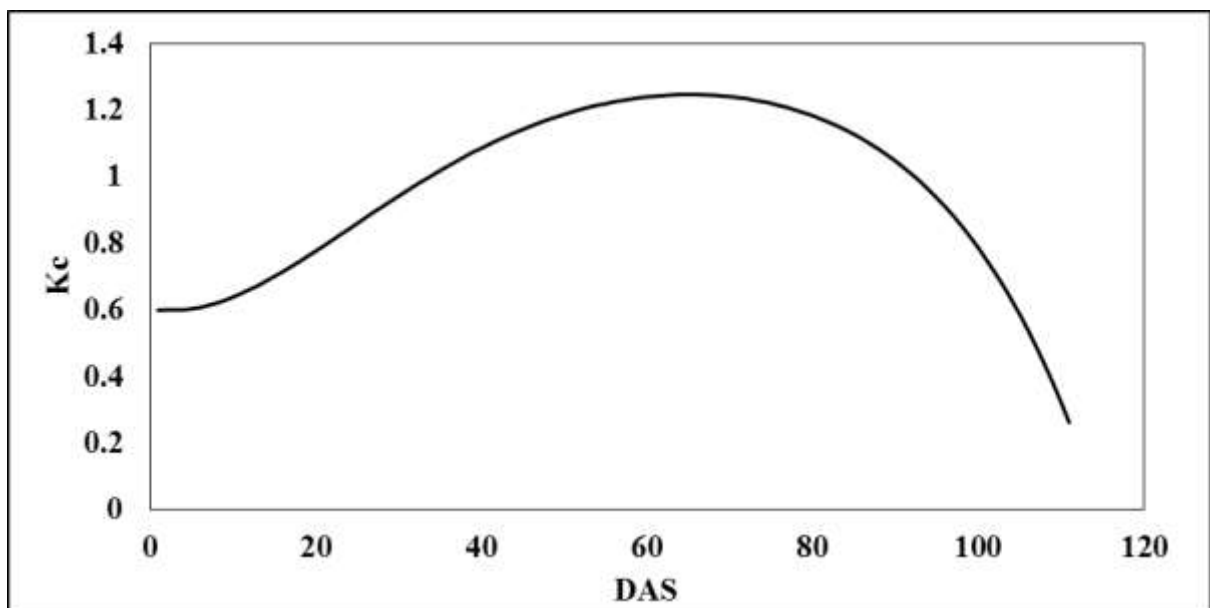


Figure 2.1 Daily Kc values of *rabi* Gram

2. Comparison of Developed Kc and FAO-56 Kc for Summer Fodder Bajra

Stage wise crop coefficients for Summer Fodder Bajra determined from first year experiment are compared with stage wise crop coefficients derived from FAO-56. Details are as given below.

Details of the experiment:

- Date of Sowing: 12th April, 2022
- Date of Harvesting: 23rd July, 2022
- Variety: Giant Bajra

Comparison of Local Kc and FAO-56 Kc:

Kc values developed from Lysimetric study during crop growth period are higher than those derived from FAO-56 for all crop stages. Values of crop coefficients for initial, development, mid- and end-season growth period are given in Table 1.1. Kc curve developed from local and FAO-56 Kc values are shown in Figure 1.1.

Table 2.1 Stage wise Developed Kc and FAO-56 Kc for Summer Fodder Bajra

Growth Stage	Duration (days)	Developed Kc	FAO-56 Kc
Initial	21	0.37	0.3
Development	28	0.87	0.65*
Mid-season	35	1.15	1.01
End-season	21	0.53	0.35

*Average of initial and mid-season Kc values as three Kc values for initial, mid- and end-season are given in FAO-56

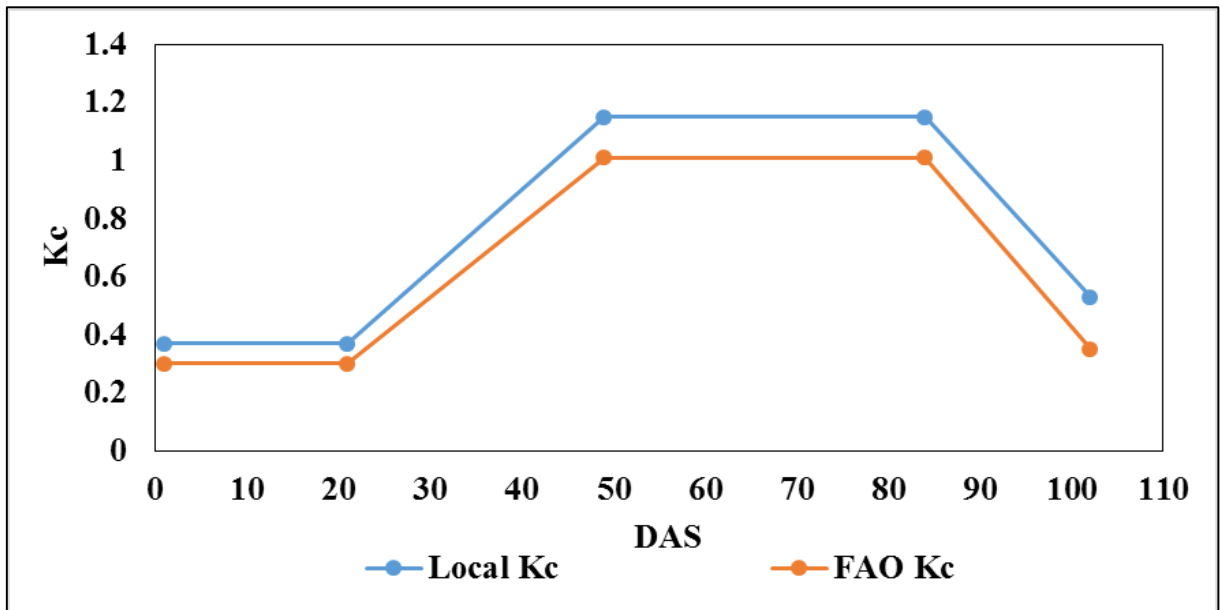


Figure 2.1: Comparison of local and FAO-56 Kc

Curve of Daily Kc values estimated using polynomial equation developed for Summer Fodder Bajra from first year experiment is shown in the Figure 2.2.

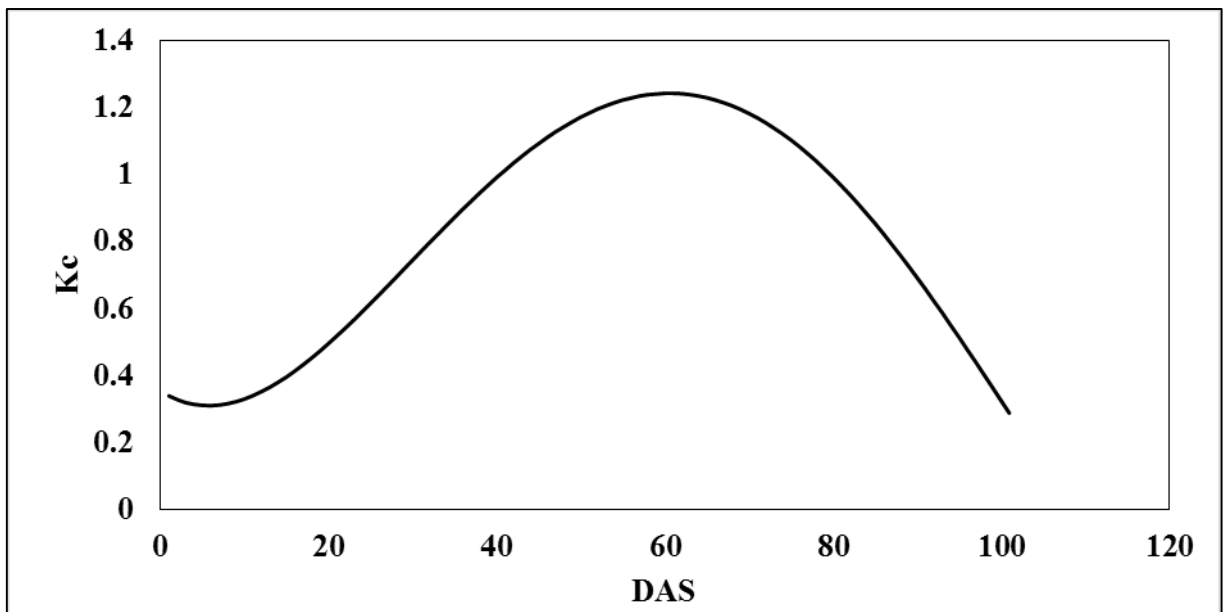


Figure 2.1 Daily Kc values of summer Fodder Bajra

3. Comparison of Developed Kc and FAO-56 Kc for Summer Sesame

Stage wise crop coefficients for Summer Sesame determined from first year experiment are compared with stage wise crop coefficients derived from FAO-56. Details are as given below.

Details of the experiment:

- Date of Sowing: 18th March, 2023
- Date of Harvesting: 13th June, 2023
- Variety: Phule Purna (JLT 408)

Comparison of Local Kc and FAO-56 Kc:

Kc values developed from Lysimetric study during crop growth period are higher than those derived from FAO-56 for initial, development and end growth stage and lower in mid-season growth stage. Values of crop coefficients for initial, development, mid- and end-season growth period are given in Table 1.1. Kc curve developed from local and FAO-56 Kc values are shown in Figure 1.1.

Table 2.1 Stage wise Developed Kc and FAO-56 Kc for Summer Fodder Bajra

Growth Stage	Duration (days)	Developed Kc	FAO-56 Kc
Initial	20	0.42	0.35
Development	25	0.75	0.74*
Mid-season	35	0.94	1.10
End-season	15	0.60	0.25

*Average of initial and mid-season Kc values as three Kc values for initial, mid- and end-season are given in FAO-56

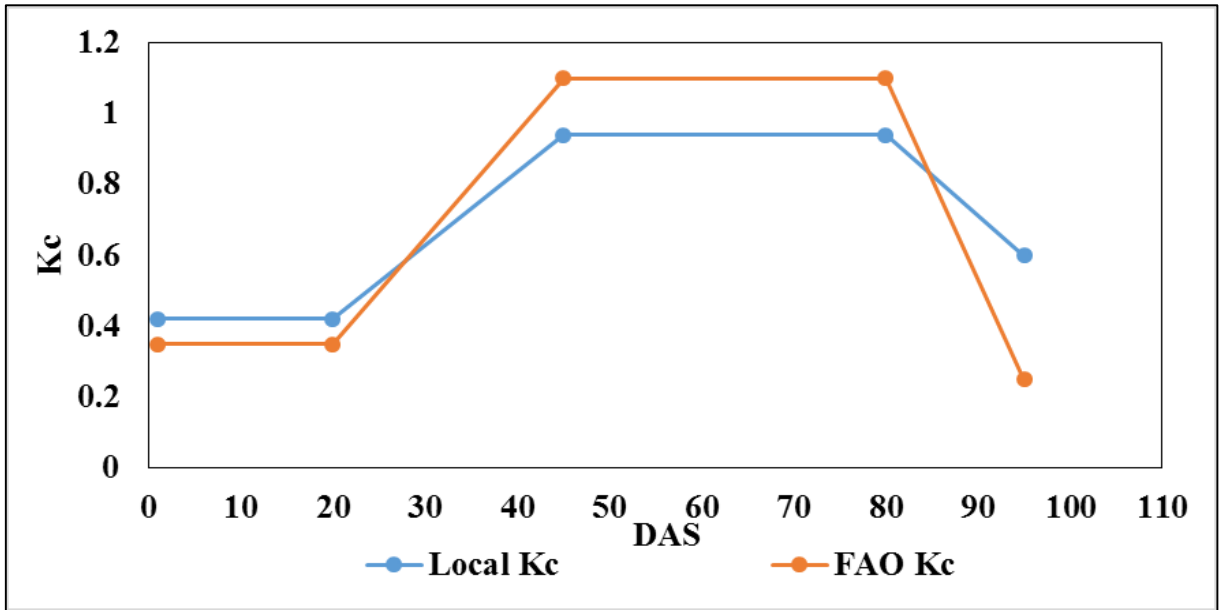


Figure 2.1: Comparison of local and FAO-56 Kc

Curve of Daily Kc values estimated using polynomial equation developed for Summer Sesame from first year experiment is shown in the Figure 2.2.

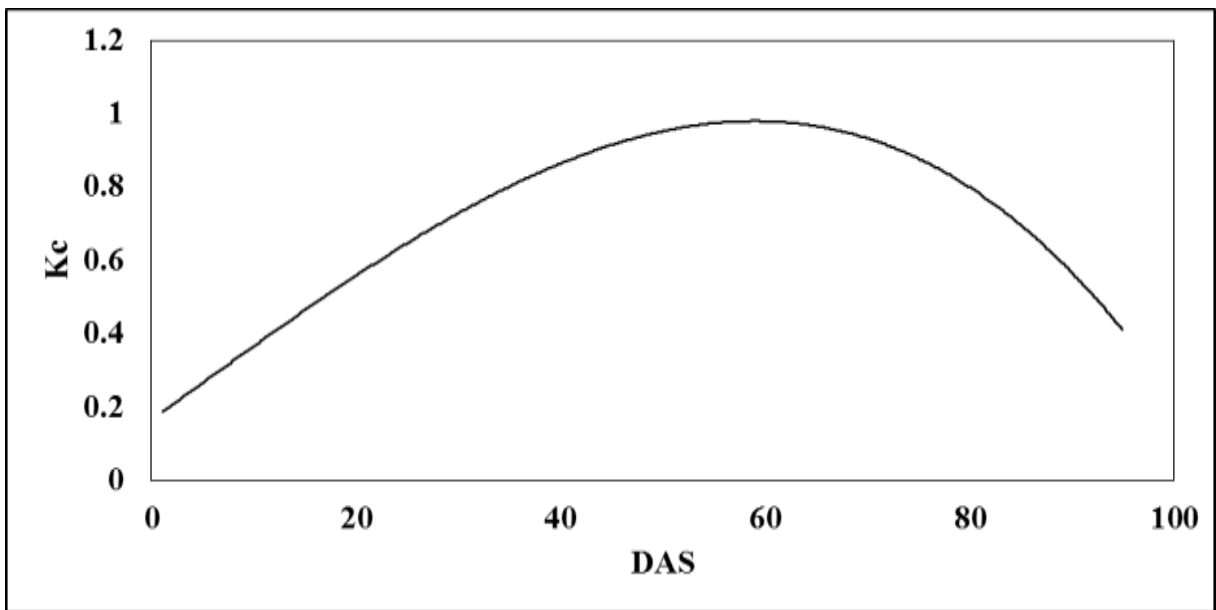


Figure 2.1 Daily Kc values of summer Sesame