**Supplementary Information**

**Enhanced-efficiency nitrogen fertilizer boosts cauliflower productivity and farmers income: Multi-location and multi-year field trials across Nepal.**

Naba Raj Pandit 1 \*, Yam Kanta Gaihre 1, 2, Shriniwas Gautam 3, Shashish Maharjan 1, Shree Prasad Vista 4, Dyutiman Choudhary 1

1 International Maize and Wheat Improvement Center (CIMMYT), P.O. Box 5186, Lalitpur, Nepal

2 International Fertilizer Development Center (IFDC), Lalitpur, Nepal

3 Pulte Institute for Global Development, University of Notre Dame, Indiana, USA

4 National Soil Science Research Center (NSSRC), Nepal Agricultural Research Council (NARC), Lalitpur, Nepal

\*Corresponding author email: [N.PANDIT@cgiar.org](mailto:N.PANDIT@cgiar.org)

Diagram

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**Fig S1.** Map showing the location of maize and rice field trials across seven districts in Nepal.

Chart, histogram

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**Fig S2.** Minimum and maximum temperature and cumulative annual precipitation across trial location for the year 2018 and 2019.

Chart, diagram

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**Fig. S3.** Cauliflower yield in response to variable nitrogen (N) rates following traditional conventional N management practices across seven districts (Dang, Palpa, Doti, Kavre, Surkhet, Bardiya and Kailali) in the year 2017 (n=60). Across the districts, optimal N rate was identified as 150 kg N ha-1 with the use of conventional granular urea (CIMMYT, NSAF, unpublished results).

Chart

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**Fig S4.** Effect of EENFs (SCU, PCU and UB) on cauliflower yield (fig a) and productivity (fig b) in two agroecological region (hills and terai).

Chart, scatter chart

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**Fig S5.** Relationship between soil properties (pH, OM, total N%, available P and K) and cauliflower yield across the districts (n=81).

**Table. S1.** Total variable cost (TVC) and gross margin (GM) of cauliflower for various treatments across seven districts.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Districts** | **Description** | **Unit** | **CK** | **FP** | **CU** | **SCU** | **PCU** | **UB** |
|  |  |  |  |  |  |  |  |  |
| Dang | Seed1 | USD | 210 | 210 | 210 | 210 | 210 | 210 |
|  | Fertilizers2 | USD | 0 | 27 | 239 | 285 | 278 | 234 |
|  | Labor3 | USD | 1380 | 1397 | 1397 | 1392 | 1392 | 1392 |
|  | Cauliflower yield4 | Kg ha-1 | 19691 | 30188 | 30188 | 39846 | 40542 | 40355 |
|  | Gross margin (GM) | USD | **3417** | **6041** | **5830** | **8243** | **8427** | **8424** |
| Palpa | Seed1 | USD | 210 | 210 | 210 | 210 | 210 | 210 |
|  | Fertilizers2 | USD | 0 | 31 | 239 | 285 | 278 | 234 |
|  | Labor3 | USD | 1380 | 1397 | 1397 | 1392 | 1392 | 1392 |
|  | Cauliflower yield4 | Kg ha-1 | 21821 | 27383 | 35340 | 42155 | 43560 | 51962 |
|  | Gross margin (GM) | USD | **3958** | **5324** | **7139** | **8830** | **9195** | **11374** |
| Doti | Seed1 | USD | 210 | 210 | 210 | 210 | 210 | 210 |
|  | Fertilizers2 | USD | 0 | 87 | 239 | 285 | 278 | 234 |
|  | Labor3 | USD | 1380 | 1397 | 1397 | 1392 | 1392 | 1392 |
|  | Cauliflower yield4 | Kg ha-1 | 16783 | 22838 | 28009 | 38461 | 38518 | 37160 |
|  | Gross margin (GM) | USD | **2677** | **4113** | **5276** | **7891** | **7913** | **7611** |
| Kavre | Seed1 | USD | 210 | 210 | 210 | 210 | 210 | 210 |
|  | Fertilizers2 | USD | 0 | 91 | 239 | 285 | 278 | 234 |
|  | Labor3 | USD | 1380 | 1397 | 1397 | 1392 | 1392 | 1392 |
|  | Cauliflower yield4 | Kg ha-1 | 17000 | 25766 | 45453 | 55302 | 61605 | 53278 |
|  | Gross margin (GM) | USD | **2732** | **4854** | **9710** | **12172** | **13782** | **11709** |
| Surkhet | Seed1 | USD | 210 | 210 | 210 | 210 | 210 | 210 |
|  | Fertilizers2 | USD | 0 | 90 | 239 | 285 | 278 | 234 |
|  | Labor3 | USD | 1380 | 1397 | 1397 | 1392 | 1392 | 1392 |
|  | Cauliflower yield4 | Kg ha-1 | 17498 | 28933 | 39313 | 50023 | 50729 | 51051 |
|  | Gross margin (GM) | USD | **2859** | **5660** | **8149** | **10830** | **11017** | **11143** |
| Bardiya | Seed1 | USD | 210 | 210 | 210 | 210 | 210 | 210 |
|  | Fertilizers2 | USD | 0 | 69 | 239 | 285 | 278 | 234 |
|  | Labor3 | USD | 1380 | 1397 | 1397 | 1392 | 1392 | 1392 |
|  | Cauliflower yield4 | Kg ha-1 | 20012 | 22827 | 41362 | 50502 | 50308 | 53166 |
|  | Gross margin (GM) | USD | **3498** | **4128** | **8670** | **10952** | **10910** | **11681** |
| Kailali | Seed1 | USD | 210 | 210 | 210 | 210 | 210 | 210 |
|  | Fertilizers2 | USD | 0 | 97 | 239 | 285 | 278 | 234 |
|  | Labor3 | USD | 1380 | 1397 | 1397 | 1392 | 1392 | 1392 |
|  | Cauliflower yield4 | Kg ha-1 | 13688 | 23839 | 40908 | 55387 | 48942 | 48918 |
|  | Gross margin (GM) | USD | **1890** | **4358** | **8555** | **12194** | **10563** | **10601** |
| **Disaggregated by region** |  |  |  |  |  |  |  |  |
| Mid-hills | Seed1 | USD | 210 | 210 | 210 | 210 | 210 | 210 |
|  | Fertilizers2 | USD | 0 | 65 | 239 | 285 | 278 | 234 |
|  | Labor3 | USD | 1380 | 1397 | 1397 | 1392 | 1392 | 1392 |
|  | Cauliflower yield4 | Kg ha-1 | 18559 | 27022 | 35661 | 45157 | 46991 | 46761 |
|  | Gross margin (GM) | USD | **3128** | **5198** | **7220** | **9593** | **10066** | **10052** |
| Terai | Seed1 | USD | 210 | 210 | 210 | 210 | 210 | 210 |
|  | Fertilizers2 | USD | 0 | 83 | 239 | 285 | 278 | 234 |
|  | Labor3 | USD | 1380 | 1397 | 1397 | 1392 | 1392 | 1392 |
|  | Cauliflower yield4 | Kg ha-1 | 16850 | 23333 | 41135 | 52944 | 49625 | 51052 |
|  | Gross margin (GM) | USD | **2693** | **4242** | **8612** | **11573** | **10736** | **11143** |

1 Cost of seed for farmers practice (FP) is calculated based on seed price in their districts.

2 Cumulative cost of CU, DAP, MOP, PCU, briquetted urea and micronutrients required per hectare.

3 labor cost used for fertilizer application and other agronomical practices such as weeding, pest management and harvesting.

4 Average cauliflower yield from both years (cauliflower price per kg is NRs 30 (USD 0.25))