

SOIL | PLANTS | PEOPLE | A HEALTHY PLANET

# Planting Sugarcane Setts in the Centre of the 42-Inch Bed

*Why the sett goes in the centre of the permanent bed, why it must never wait in dry soil, and what a poor germination at Haroonabad teaches*

**A sugarcane sett is a stored packet of juice. That juice feeds the bud until the young plant has roots and leaves of its own. PQNK lays the sett in the centre of the permanent 42-inch bed, in soil at wattar, so the juice is kept for the bud and is not lost to a dry soil before the water arrives.**

## Abstract

PQNK plants sugarcane once, in the centre of the permanent 42-inch bed, and never earths it up. Our strongest recommendation is to raise a nursery and transplant; where setts are planted, this paper sets out how they are prepared and planted, and why. The sett is the young plant's only food until its roots and leaves take over, so the whole planting is designed to protect the juice it carries: setts are cut so that their juice stays sealed in whole internodes, with both cut ends sealed with cement, laid lengthwise in a shallow slit along the centre of the bed while the soil is at wattar, covered with soil and then with mulch. A sett laid in dry soil loses its juice through its cut ends before water reaches it, and its bud fails. A planting at Haroonabad in September and October 2026, where setts were laid in dry soil and watered afterwards, shows what happens when that rule is broken. The two sides of the bed stay free for crop-in-crop, such as two lines of canola.

## 1. Why the Centre of the Bed

The standard PQNK profile has a 42-inch bed top, an 18-inch furrow top, an 8-inch furrow bottom and an 8-inch depth (Chapter Twenty-Three). Sugarcane is planted once in the centre of that bed and is never earthed up: the hardpan below has been broken, the roots go deep, and anchorage comes from the roots, not from soil piled around the stem (Chapter Thirty-Seven, KP-211). The crown stays near the aerated surface, and new tillers rise from the inside of the stool (KP-218).

The centre is also the right place for moisture. When water is given in the furrows it moves sideways into the bed from both sides. At Haroonabad the moisture moved about 9 inches into the bed within an hour and a quarter and was expected to meet in the centre by evening. The centre is therefore the last part of the bed to dry and the last to be saturated: a moist, aerated root zone for the sett. And with the cane in the centre, the two sides of the bed remain free for other crops.

## 2. What the Sett Does

A sett is a piece of cane stalk carrying one or more buds. Until the bud has formed roots and opened enough leaves, it cannot feed itself: it lives on the juice stored in the sett. That juice is its

energy. With it, the bud pushes out its first roots and its shoot. Without it, the bud cannot germinate, and if it does germinate on the last of its juice, the young shoot will not survive.

Of the whole plant's dry weight, above and below ground, more than 95 percent is carbon, hydrogen and oxygen, built by photosynthesis from carbon dioxide taken from the air through the leaves, and from water. Nitrogen, a few percent more, also comes from the air, made available in the soil by microbes. Only the small remainder, the minerals, comes from the soil itself. Until its first leaves are open and working, the young plant has no other source of energy than the sett. No leaves, no energy, and no survival. So two things must last until the roots have formed and there are enough leaves for the plant to carry on growing by itself: the juice in the sett, and moist, aerated soil around it.

### 3. Never Let the Sett Wait in Dry Soil

Juice leaves a sett only through its exposed parts, above all its cut ends. A dry soil draws moisture from whatever it touches. A sett laid in dry soil is therefore drained through its cut ends from the moment it is placed, and if the water reaches it a day or two later, the juice the bud needed may already be gone. The rule is simple: the sett must go into soil that is already at wattar, moist enough to form a ball when pressed in the hand (the ball test), and never wait in dry soil for water to follow.

The PQNK planting is done in this order. When the bed is at wattar, open a small, shallow slit along the centre of the bed. Lay the setts in it lengthwise, at about two inches depth (Chapter Thirty-Seven). Cover them with soil, and then lay mulch over the bed. The mulch keeps the soil surface from drying and from heating, so the sett stays in moist, aerated soil while the bud roots and shoots.

### 4. How a Sett Keeps or Loses Its Juice

Sugarcane stores its juice in the internodes, the lengths of stalk between the nodes. Each internode is a sealed store: the hard skin around it and the node at each end close it in. As long as an internode is whole, its juice stays inside, ready for the bud. When the stalk is cut through an internode, that store is opened, and the cut face is where the juice leaves. How the sett is cut therefore decides how much juice the bud will still have when it needs it. The two pictures below show what to look for.



*Picture 1: a sett cut with a single node in the centre and the stalk cut open on both sides.*

In Picture 1 the sett has only one node, in the centre, and the stalk is cut open on both sides of it. Both halves are exposed. Laid in dry soil, this sett loses its juice through both cut faces: the dry soil absorbs it, and the sett can dry out within a few hours. The bud on the node is then left without the energy it needs. It will not germinate, and if it does, the shoot will not survive.



*Picture 2: a sett cut about 2 inches away from the nodes, with a whole internode between them.*

In Picture 2 the stalk is cut about 2 inches away from the node at each end (the piece shown carries no buds; it shows how the cut is made). The short lengths beyond the two nodes are open, and in dry soil the juice in them is absorbed from both cut ends. The whole internode between the two nodes is different. Its skin and the nodes at its two ends protect it and hold its juice inside, so that juice stays available for the buds to grow roots and leaves.

What this means for the farmer:

- A cut face always gives its juice to a dry soil; a whole internode keeps it.
- Cut the sett so that its juice is held in whole internodes closed by nodes, about 2 inches beyond the node, and never through the stalk right beside a single bud.
- Above all, lay the sett in soil that is already at wattar. Then there is no dry soil to draw the juice out, and the bud keeps its energy until its roots and leaves can take over.

Seal both ends of every sett with cement before planting. The cut ends are the only place the juice can escape, so a coat of cement on each cut face closes them: the juice stays inside the sett for the bud until its roots and leaves have formed. Apply the cement to both ends, never to one alone, because an end left open will still lose its juice.

The quality of the seed cane matters as much as the cut. PQNK plants either setts or nursery-raised transplants, with less than 5 maunds of seed cane per acre, and adjusts the spacing of the clumps to the variety, the machinery, the intercropping plan and the population wanted (Chapter Thirty-Seven).

Where setts are planted, two nodes with a whole internode between them, and cement on both cut ends, are the safety factor. A single-node sett open on both sides (Picture 1) has no reserve against a dry soil. Where the seed cane is weak, a farmer may place two or three setts at each station to make sure of a full stand, as was done at Haroonabad; the better answer is good seed cane, cut correctly and planted at wattar. Better still is a nursery: our strongest recommendation is to raise the cane in a nursery and transplant it (see the note in Section 8).

## **5. Why the Cut Does Not Matter in Conventional Planting, and Why It Does in PQNK**

In conventional sugarcane, the way a sett is cut hardly matters. The setts are laid in furrows and the field is irrigated again and again to keep the soil saturated. A saturated soil has no dryness to pull the juice out of a sett, so open cut ends lose little, and any setts that still fail are covered by sheer quantity: nearly 150 maunds of seed cane are planted per acre.

PQNK plants with precision instead, with less than 5 maunds of seed cane per acre. The setts are laid in the middle of the raised bed, where the soil is moist and aerated and is never saturated. With so few setts, every sett matters, and each must be given the right conditions to germinate:

- cut precisely, so that its juice stays sealed in whole internodes, as explained above;
- both open ends coated with cement;
- laid in soil that is kept moist, at wattar, never dry; and
- covered with mulch, which holds the moisture and keeps the temperature even through the germination stage.

Saturated soil hides a careless cut at the cost of 150 maunds of seed and a waterlogged root zone. PQNK saves that seed and keeps the soil alive, and asks in return that each sett is prepared and placed with care.

## **6. Field Case: Haroonabad, September and October 2026**

At a PQNK farm in Haroonabad, about one acre of sugarcane was planted on permanent beds at the end of September 2026. The seed cane was weak, so single-bud setts were laid in groups of

two or three along the centre of the beds, and the beds were dry when the setts were laid. Water was started in the furrows immediately: the planting ran from morning to evening and the furrows were filled through the night, and the moisture moved about 9 inches into the bed within an hour and a quarter. The beds were then covered with a full mulch.



*Haroonabad, 30 September 2026: setts laid in groups along the centre of the dry bed (left), and furrow water moving sideways into the beds after planting (right).*

The first shoots came up well. Then, about ten days before the farmer's report of 22 October, rain fell on the mulched beds, and germination stopped: many stations produced no shoot, and setts dug out from under the mulch had dried or rotted. The farmer's reading was that the rain left too much moisture under the mulch. The PQNK reading is that the setts had already lost much of their juice: they were laid in dry, powdery soil, the soil drew the juice out through the cut ends before the water reached them, and the buds that remained had too little food left to carry them. The quality of the seed cane and the way the setts were cut add to the same loss.



*Haroonabad, 22 October 2026: a sett dug out from under the mulch, with no shoot.*

The same planting succeeded at Shorkot, Jhang. There, PQNK farmer Asif Raza Qureshi also laid his setts in dry soil and watered them afterwards, and germination was 100 percent. The difference was the soil. At Shorkot the soil is not powdery (Picture 3): it is crumbly, with open spaces between its crumbs, so it takes in water quickly, and the furrow water wets the soil around the sett before the soil can absorb its juice. At Haroonabad the soil is powdery (Picture 4), with little space between its pores for capillary movement, so it took much longer for the water to wet the soil around the sett. By then the dry soil had already absorbed the juice. Water that reaches the sett after a dry soil has dried it has no value.



*Picture 3 (left): setts at Shorkot, Jhang, on crumbly soil that takes in water quickly. Picture 4 (right): powdery soil at Haroonabad, where the furrow water was slow to wet the bed.*



*Picture 5: Shorkot, Jhang: good germination, young sugarcane shoots from setts planted in the centre of the bed.*

Shorkot shows that a sett laid in dry soil can survive where the soil takes in water fast; Haroonabad shows that it cannot be relied on. The PQNK rule stays the same for every soil: plant at wattar, and never let the sett wait in dry soil for the water to follow.

## **7. The Two Sides of the Bed: Crop-in-Crop**

With the cane in the centre, the two sides of the 42-inch bed carry other crops. At Haroonabad canola is planned in two lines, one on each side of the cane. Two lines are enough. The plants should stand at least 12 inches apart, and up to 16 inches, with two seeds per hill if wanted; 6 inches is too close. The leader shoot of each canola plant is chopped off when the plant is about 12 inches tall, so that it branches and carries more pods (KP-215). Wheat can also be grown on the sides, and toria or mustard can be sown with it, as farmers have long done.

## 8. In Practice

| Step          | What to do                                                                                                             | Why                                                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Best option   | Raise the cane in a nursery and transplant it                                                                          | Sugarcane lasts for years like bamboo; plant it as an orchard is planted                                              |
| Seed cane     | Use good, healthy seed cane: less than 5 maunds per acre, against nearly 150 maunds in conventional planting           | The sett is the young plant's only food until roots and leaves form                                                   |
| Cutting       | Keep the juice in whole internodes closed by nodes; cut about 2 inches beyond the node; seal both cut ends with cement | Skin and nodes hold the juice in; cement closes the cut faces, which otherwise lose it to dry soil (Pictures 1 and 2) |
| Soil moisture | Plant only when the bed is at wattar (ball test)                                                                       | A dry soil draws the juice out of the sett before the water arrives                                                   |
| Placement     | A shallow slit along the centre of the 42-inch bed; setts laid lengthwise about two inches deep                        | The centre stays moist and aerated; no earthing up is needed                                                          |
| Cover         | Cover with soil, then lay mulch over the bed                                                                           | Mulch keeps the soil from drying and heating                                                                          |
| Bed sides     | Two lines of canola, 12 to 16 inches apart in the line; top the leader at about 12 inches                              | Crop-in-crop: the bed earns while the cane establishes                                                                |

**Note: Our strongest recommendation is to raise a nursery and transplant. PQNK treats sugarcane as bamboo: once established it lasts for years without yield loss (KP-027). It should therefore be planted as an orchard is planted, not as a seasonal crop.**

## Conclusion

The sett carries the young cane plant until its roots and leaves can feed it. Everything in PQNK sugarcane planting protects that stored juice: good seed cane, setts cut so that their juice stays sealed in whole internodes and both ends sealed with cement, soil at wattar before the sett goes in, a shallow slit in the centre of the permanent bed, soil and then mulch over it. A sett that waits in dry soil loses its juice, and no water given afterwards can give it back. Best of all, raise the cane in a nursery and transplant it, and treat the field as an orchard.

**PQNK Principle: Plant the sett in moist soil, in the centre of the bed, and keep its juice for the bud. Never let the sett wait in dry soil for the water to follow.**

## Related PQNK Sources

1. PQNK Book, Chapter 23: The Eight-Step Transition Protocol; Chapter 37: Sugarcane, The Bamboo Principle. <https://pedaver.com/books/natural-ecosystem-science/>
2. KP-027: Sugarcane: The Bamboo Principle. <https://pedaver.com/papers/sugarcane-the-bamboo-principle/>
3. KP-211: Why PQNK Sugarcane Does Not Need Earthing Up. <https://pedaver.com/papers/why-pqnk-sugarcane-does-not-need-earthing-up/>
4. KP-218: Why PQNK Sugarcane Tillers From the Inside. <https://pedaver.com/papers/why-pqnk-sugarcane-tillers-from-the-inside/>
5. KP-028: Sugarcane Cultivation on PQNK: A Perennial, Circular Production System. <https://pedaver.com/papers/sugarcane-cultivation-on-pqnk/>
6. KP-215: Rapeseed, Frost and the Sowing Window. <https://pedaver.com/papers/rapeseed-frost-and-the-sowing-window/>

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