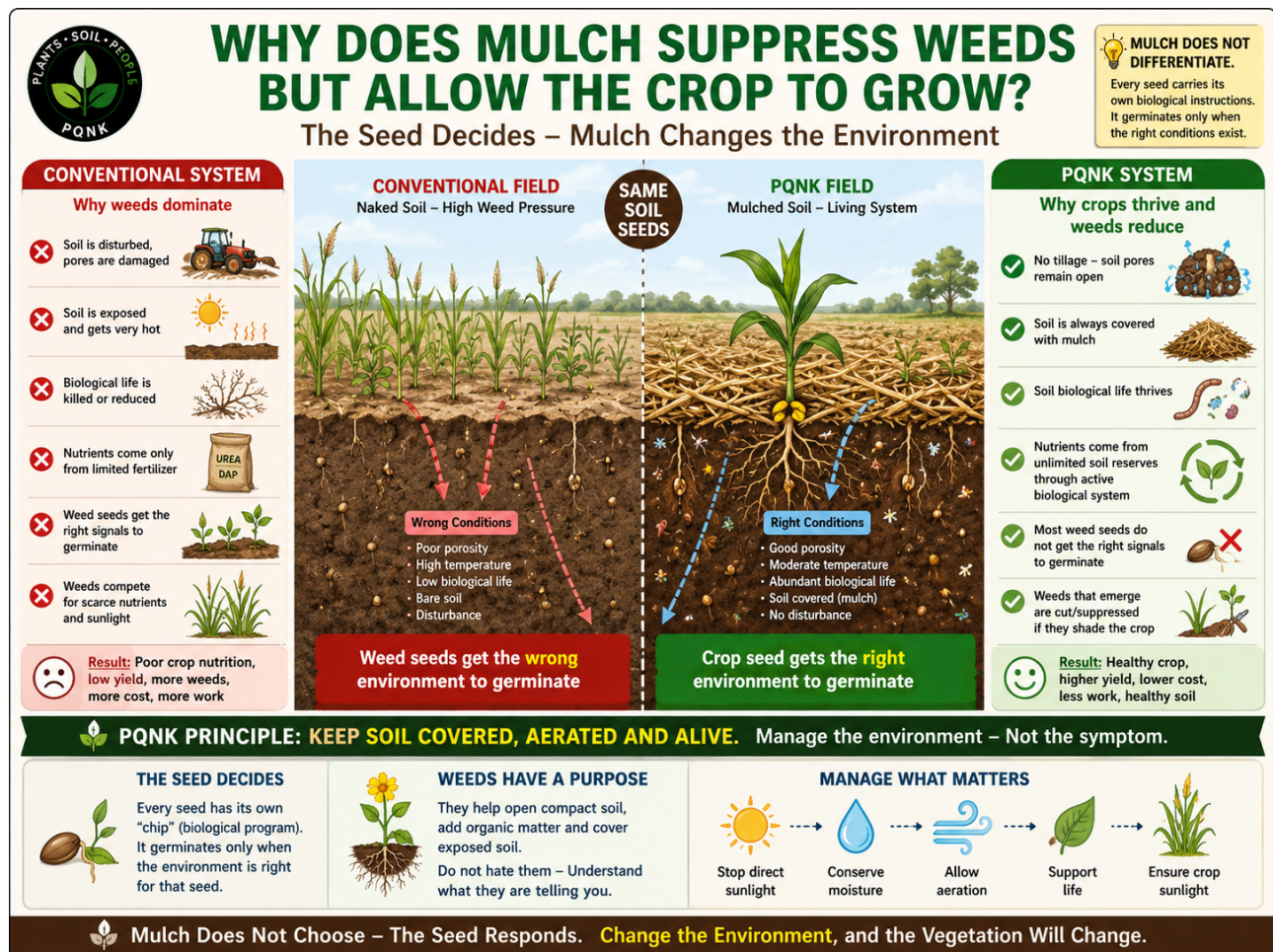


Why Does Mulch Suppress Weeds but Allow the Crop to Grow?

Understanding Weed Germination, Nutrient Competition and the Ecological Role of Weeds under PQNK



A farmer recently asked:

“How does the mulch layer differentiate between weed seeds and our own desired seed that we plant beneath the mulch layer?”

The question arises from a familiar observation. Under a well-managed mulch layer, the deliberately planted crop emerges, while weed pressure can decline substantially. It can therefore appear as though mulch somehow distinguishes between the crop seed and the weed seed.

It does not.

Mulch does not decide which plant should grow. The seed responds to the conditions surrounding it.

Understanding this distinction takes us beyond weed control and into one of the fundamental differences between conventional agriculture and PQNK.

The Seed Carries Its Own Biological Instructions

Every seed carries biological instructions governing its behaviour. A farmer-friendly way of understanding this is to imagine that every seed contains its own biological “**chip.**” Encoded within that living system are responses to environmental conditions that determine whether the seed remains dormant or begins germination.

Moisture, temperature, oxygen, light exposure, soil physical conditions and other environmental signals influence that response.

This explains something farmers observe constantly: enormous numbers of seeds may exist in the soil, yet they do not all germinate together.

The important question is therefore not simply:

“Are weed seeds present?”

They almost certainly are.

The more useful question is:

“What conditions caused these particular weed seeds to germinate now?”

That changes our understanding of weeds completely.

Why Do Weeds Appear?

Under the PQNK interpretation explained to farmers, two conditions are especially important in creating the environment in which weeds become prominent:

poor soil porosity and exposed soil.

When soil pores are not functioning adequately, plants with aggressive and penetrating root systems help open pathways through the soil. Their roots contribute to the movement of air and water and participate in rebuilding the physical soil environment.

The second condition is naked soil.

Nature does not ordinarily maintain productive land as permanently exposed bare ground. Where the surface becomes exposed, vegetation attempts to occupy it.

This leads to a fundamental PQNK principle:

The soil should never remain naked.

It should be protected by living vegetation, organic residues, dead mulch, or an appropriate combination of biological cover.

From this perspective, weeds are not appearing randomly. Their presence can tell the Production Manager something about the condition of the system.

Why Does Conventional Agriculture Fight Weeds So Aggressively?

There is another important part of the story.

Conventional agriculture generally assumes that weeds compete with the crop for the fertilizer applied by the farmer.

This concern is understandable within that production system.

If the natural soil nutrient-delivery mechanism is not functioning adequately, the farmer supplies nutrients through bags of fertilizer. That fertilizer represents a **limited quantity of immediately available nutrients** purchased for the crop.

The farmer therefore reasons:

“If weeds consume the fertilizer I have applied, what will remain for my crop?”

Weeds consequently become competitors that must be destroyed.

But this reasoning depends upon an agricultural system in which crop nutrition has been reduced largely to the quantity of soluble nutrients supplied by the farmer.

PQNK approaches nutrition differently.

The Wheat, Flour and Bread Analogy

The distinction can be understood through a simple household example.

Suppose a family stores a sack of wheat.

They do not convert the entire sack into cooked bread immediately. Wheat can remain stored for a comparatively long period, whereas bread is perishable.

Instead, wheat is progressively converted according to need:

stored wheat → flour → dough → bread.

But there is something essential between the wheat and the bread:

a functioning conversion system.

Someone must grind the wheat, prepare the dough and bake the bread.

Remove that function and the wheat may still be sitting in the house in abundance—but there will be no bread on the table.

The problem is not necessarily shortage of wheat.

The conversion system has stopped functioning.

This analogy helps explain the PQNK view of soil minerals.

The geological soil reserve contains nutrients largely in forms that are not equivalent to a bag of immediately soluble fertilizer. The living soil system—microorganisms, fungi, roots and their interactions—participates in converting and delivering nutrients into forms plants can use according to biological demand.

When that biological conversion system is damaged, nutrient abundance in the soil does not automatically mean adequate plant nutrition.

The farmer then substitutes externally supplied fertilizer for a biological function that has ceased to operate effectively.

In the household analogy, if nobody can turn the wheat into bread, the family has to bring prepared food from outside.

What Happened to the Soil's Conversion System?

PQNK identifies conventional management practices themselves as major causes of disruption to this biological machinery.

Repeated tillage disturbs soil habitat.

Flooding or prolonged inundation removes the aerated conditions required by much of the living soil system.

Leaving soil naked exposes it directly to solar radiation and extreme surface temperatures.

Over time, the physical habitat and biological communities responsible for nutrient cycling and delivery are impaired.

The farmer then encounters plants showing nutritional deficiencies even though the soil itself may contain substantial mineral reserves.

The conventional response is to supply nutrients externally.

PQNK attempts instead to **restore the biological conversion and delivery system.**

What Changes When the Soil System Recovers?

PQNK removes the conditions responsible for biological dysfunction:

no unnecessary soil disturbance;

no inundation;

permanent biological or organic cover;

and maximum biodiversity.

Roots remain in the soil. Organic material remains at the surface. Soil organisms are protected. Porosity begins recovering. Air and water can move through the soil environment, and biological nutrient cycling progressively resumes.

The stored “wheat” is once again connected to the machinery that produces the “bread.”

Once that happens, the conceptual basis of nutrient competition also changes.

PQNK does not view the nutrient supply simply as a small quantity of fertilizer placed in the field that must be divided between the crop and every other plant growing there.

The living system continuously participates in nutrient transformation and delivery.

Therefore, the presence of another plant does not automatically mean that it is stealing a fixed bag of fertilizer intended for the cash crop.

Then Are Weeds Never a Problem?

They can be.

But the critical competition under PQNK is primarily **above the soil surface**.

Every green plant requires sunlight.

If weeds grow high enough or densely enough to shade the cash crop, they interfere with its access to solar energy. At that point they should be suppressed, cut or otherwise managed, not uprooted.

But consider a low-growing plant covering otherwise exposed soil without shading the crop.

It may not be harming the crop in the way conventional weed-control thinking assumes. It is covering the soil, intercepting sunlight that would otherwise strike the soil surface, producing roots, contributing biological material and participating in the ecosystem.

Therefore:

Do not automatically destroy a plant merely because conventional agriculture has classified it as a weed. First determine what it is doing in the system.

If it is shading the cash crop, manage it.

If it is simply covering exposed soil without interfering with crop access to sunlight, its ecological function should also be considered.

Now Return to the Farmer's Original Question

We can now answer it more completely.

Mulch does not distinguish between the desired crop seed and a weed seed.

The deliberately planted crop seed has been placed by the Production Manager under conditions selected for its germination.

Weed seeds already present in the soil have their own biological germination requirements. As PQNK eliminates repeated soil disturbance, improves porosity and keeps the soil permanently covered, the environmental signals associated with weed emergence change.

The weed seed may remain present.

But presence of a seed and germination of that seed are two different things.

This is why weed suppression under PQNK should not be understood simply as a thick mulch physically preventing weeds from pushing through.

Mulch Must Never Become a Barrier to Life

This point connects directly with another important PQNK lesson.

Mulch exists primarily to prevent direct solar radiation from striking the soil and to create a protective buffer between the soil and the atmosphere. It must also allow gaseous exchange.

Therefore, mulch should **not** be piled so densely that it restricts aeration.

A very thick layer of finely chopped wheat straw, for example, can settle into a dense mat. Instead of merely intercepting sunlight, it can restrict air movement and create oxygen stress around the root zone.

The objective is not to suffocate weeds.

The objective is to **protect the living soil while allowing it to breathe.**

This distinction is fundamental.

From Weed Killing to Reading the Field

Conventional agriculture generally asks:

“How do I kill this weed?”

PQNK asks first:

“Why has this plant appeared here?”

Is the soil exposed?

Is porosity still inadequate?

Is the field still undergoing biological transition?

Is this vegetation actually interfering with the cash crop?

Is it shading the crop, or merely covering soil that would otherwise remain naked?

These questions transform weeds from nothing more than enemies into **ecological indicators**.

The Production Manager begins reading the field instead of automatically fighting everything growing in it.

The PQNK Principle

The farmer who originally asked the question responded after hearing the explanation:

“It already begins to make sense, as weeds are designed for a purpose.”

That observation captures the larger lesson.

Nature does not require mulch to recognize a crop and reject a weed.

Each seed carries its own biological instructions. Each plant responds to the environment it encounters. When agricultural management damages soil structure and leaves the surface naked, one vegetation response emerges. When porosity, biological activity and permanent cover are restored, that environment changes—and the plant community changes with it.

PQNK therefore does not manage weeds merely by killing plants. It manages the conditions that determine why those plants are appearing in the first place.

And where vegetation does emerge, the practical rule remains simple:

Keep the soil covered. Keep it aerated. Allow biodiversity. Intervene when vegetation interferes with the cash crop's access to sunlight—not simply because another plant exists.

Suggested Knowledge Library classification

Primary Science: Biodiversity / Soil

Problem Family: Pests, Diseases & Weeds

Field Problems: Weed Pressure; Poor Soil Structure/Aggregation; Bare Soil

Field Practice: Mulching / Soil Cover; Biodiversity Management

Questions Answered:

“How does mulch know which seed is a weed?”

“Why do weeds germinate under some conditions but not others?”

“Do weeds compete with crops for nutrients?”

“Should all weeds be removed under PQNK?”

“Why do weeds appear when soil is bare or poorly structured?”

“When should weeds be cut or suppressed?”

Mulch is the farmer's doorway into a much bigger PQNK principle: **weeds are a response to the state of the production ecosystem, and managing the ecosystem is more fundamental than killing the response.**

Applying PQNK without understanding nature's operating system will not deliver abundance, stability, or nutrient density.

*PQNK (pronounced "picnic")—the regenerative & sustainable **Pristine Organic Farming System**—is grounded in **Natural Ecosystem Science**. This science employs perennial biodiversity, protects soil with organic mulch, and avoids practices such as water inundation, tillage disturbance, and leaving soil bare.*

*It is the **process** that matters most. PQNK is a pristine production system designed not merely for yield, but for optimal, balanced output—where quality, sustainability, and ecological harmony emerge from a self-regulated, zero-external-input methodology.*

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