Department of Justice/Drug Enforcement Administration
Drug Fact Sheet

Marijuana/Cannabis

WHAT IS MARIJUANA?

Marijuana is a mind-altering (psychoactive) drug, produced by the *Cannabis sativa* plant. Marijuana has over 480 constituents. THC (delta-9-tetrahydrocannabinol) is believed to be the main ingredient that produces the psychoactive effect.

WHAT IS ITS ORIGIN?

Marijuana is grown in the United States, Canada, Mexico, South America, Caribbean, and Asia. It can be cultivated in both outdoor and indoor settings.

What are common street names?

Common street names include:

- Aunt Mary, BC Bud, Blunts, Boom, Chronic, Dope, Gangster, Ganja, Grass, Hash, Herb, Hydro, Indo, Joint, Kif, Mary Jane, Mota, Pot, Reefer, Sinsemilla, Skunk, Smoke, Weed, and Yerba

What does it look like?

Marijuana is a dry, shredded green/brown mix of flowers, stems, seeds, and leaves from the *Cannabis sativa* plant. The mixture typically is green, brown, or gray in color and may resemble tobacco.

How is it abused?

Marijuana is usually smoked as a cigarette (called a joint) or in a pipe or bong. It is also smoked in blunts, which are cigars that have been emptied of tobacco and refilled with marijuana, sometimes in combination with another drug. Marijuana is also mixed with foods or brewed as a tea.

What is its effect on the mind?

When marijuana is smoked, the active ingredient THC passes from the lungs and into the bloodstream, which carries the chemical to the organs throughout the body, including the brain. In the brain, THC connects to specific sites called cannabinoid receptors on nerve cells and influences the activity of those cells.

Many of these receptors are found in the parts of the brain that influence:

- Pleasure, memory, thought, concentration, sensory and time perception, and coordinated movement

The short-term effects of marijuana include:

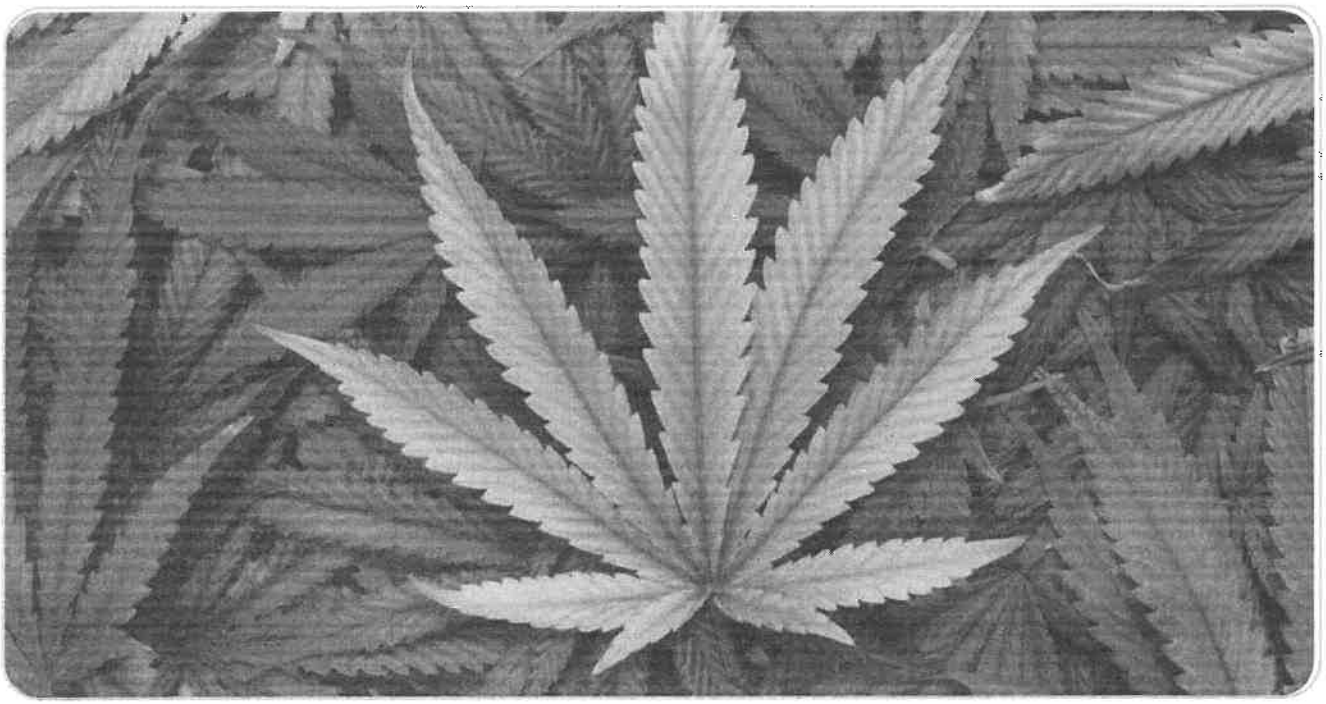
- Problems with memory and learning, distorted perception, difficulty in thinking and problem-solving, and loss of coordination

The effect of marijuana on perception and coordination are responsible for serious impairments in learning, associative processes, and psychomotor behavior (driving abilities).

Long term, regular use can lead to physical dependence and withdrawal following discontinuation, as well as psychological addiction or dependence.

Clinical studies show that the physiological, psychological, and behavioral effects of marijuana vary among individuals and present a list of common responses to cannabinoids, as described in the scientific literature:

- Dizziness, nausea, tachycardia, facial flushing, dry mouth, and tremor initially
- Merriment, happiness, and even exhilaration at high doses



Marijuana Leaves

- Disinhibition, relaxation, increased sociability, and talkativeness
- Enhanced sensory perception, giving rise to increased appreciation of music, art, and touch
- Heightened imagination leading to a subjective sense of increased creativity
- Time distortions
- Illusions, delusions, and hallucinations are rare except at high doses
- Impaired judgment, reduced coordination, and ataxia, which can impede driving ability or lead to an increase in risk-taking behavior
- Emotional lability, incongruity of affect, dysphoria, disorganized thinking, inability to converse logically, agitation, paranoia, confusion, restlessness, anxiety, drowsiness, and panic attacks may occur, especially in inexperienced users or in those who have taken a large dose
- Increased appetite and short-term memory impairment are common

What is its effect on the body?

Short-term physical effects from marijuana use may include:

- Sedation, bloodshot eyes, increased heart rate, coughing from lung irritation, increased appetite, and increased blood pressure (although prolonged use may cause a decrease in blood pressure).

Marijuana smokers experience serious health problems such as bronchitis, emphysema, and bronchial asthma. Extended use may cause suppression of the immune system. Withdrawal from chronic use of high doses of marijuana causes physical signs including headache, shakiness, sweating, and stomach pains and nausea.

Withdrawal symptoms also include behavioral signs such as:

- Restlessness, irritability, sleep difficulties, and decreased appetite

What are its overdose effects?

No deaths from overdose of marijuana have been reported.

Which drugs cause similar effects?

Hashish and hashish oil are drugs made from the cannabis plant that are like marijuana, only stronger.

Hashish (hash) consists of the THC-rich resinous material of the cannabis plant, which is collected, dried, and then compressed into a variety of forms, such as balls, cakes, or cookie like sheets. Pieces are then broken off, placed in pipes or mixed with tobacco and placed in pipes or cigarettes, and smoked.

The main sources of hashish are the Middle East, North Africa, Pakistan, and Afghanistan.

Hashish oil (hash oil, liquid hash, cannabis oil) is produced by extracting the cannabinoids from the plant material with a solvent. The color and odor of the extract will vary, depending on the solvent used. A drop or two of this liquid on a cigarette is equal to a single marijuana joint. Like marijuana, hashish and hashish oil are both Schedule I drugs.

What is its legal status in the United States?

Marijuana is a Schedule I substance under the Controlled Substances Act, meaning that it has a high potential for abuse, no currently accepted medical use in treatment in the United States, and a lack of accepted safety for use under medical supervision.

Although some states within the United States have allowed the use of marijuana for medicinal purpose, it is the U.S. Food and Drug Administration that has the federal authority to approve drugs for medicinal use in the U.S. To date, the FDA has not approved a marketing application for any marijuana product for any clinical indication. Consistent therewith, the FDA and DEA have concluded that marijuana has no federally approved medical use for treatment in the U.S. and thus it remains as a Schedule I controlled substance under federal law.

Marinol is a synthetic version of THC in a capsule (also referred to as dronabinol, the generic or International Nonproprietary Name given to THC), prescribed for the control of nausea and vomiting caused by chemotherapeutic agents used in the treatment of cancer and to stimulate appetite in acquired immune deficiency syndrome (AIDS) patients. Marinol is a Schedule III drug under the Controlled Substances Act.

Syndros is an oral dronabinol (THC) solution that is used for the treatment of anorexia associated with weight loss in patients who have failed to respond adequately to conventional antiemetic treatments. Syndros is a Schedule II drug under the Controlled Substances Act.

Epidoloex is an oral solution of cannabidiol (CBd) that has no more that 0.1% THC, used to treat two epilepsy conditions, Dravet syndrome and Lennox-Gestaut syndrome. Epidoloex is a Schedule V drug under the Controlled Substances Act.

How to Increase THC When Growing Weed

by Nebula Haze

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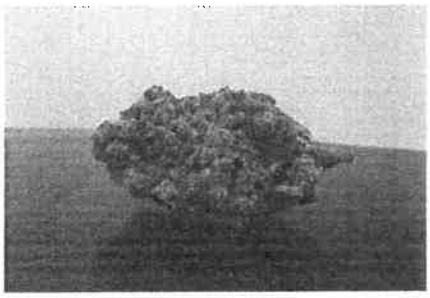
Increasing Cannabis Potency During the Growing Process

When it comes to growing cannabis, there are lots of different goals by different growers. Many growers are growing medical marijuana for medical-related purposes. Others are growing for their personal adult use. For many growers, including both medical marijuana and recreational cannabis growers, a common goal is to maximize the amount of THC and other cannabinoids produced when growing cannabis (ie increase the "potency" of your buds).

High-THC buds are the result of combining potent genetics with proper cannabis cultivation techniques.



Why Increase Maximum THC Levels?

- Increase mental and psychoactive effects from the same amount of bud (your harvest will go further)
- Many medical marijuana growers desire high THC levels for the relief of nausea, certain types of pain, spasticity, certain symptoms of multiple sclerosis, etc.
- Many of the tactics to increase THC levels also increase your overall cannabis yields

However, not every grower wants the highest levels of THC in their bud, and may seek other cannabinoids found in certain strains. For example, there are many medical marijuana growers who prefer *low*-THC, high-CBD cannabis, which is non-psychoactive and may be of interest to those looking for possible relief from anxiety or seizures. Learn more about the difference between CBD and other cannabinoids like THC. Unfortunately, you can't use grow methods to increase CBD levels and reduce THC at the same time; you need to start with a low-THC, high-CBD strain.
Learn how to increase CBD levels in your buds

Much of the THC and "potency" in your buds is contained in the sparkly trichomes

What increases THC levels and overall potency?

These are the most important factors that will affect your THC levels and overall marijuana potency:

- High-THC Strain (genetics is **most** important)
- Harvesting at the Right Time
- Good Plant Health & Care While Buds Form
- Light Levels / Spectrum
- Curing Buds in Jars
- Common Myth: CO2

Strain & Individual Plant Genetics

Your plant's *genes* are *hands-down* the most important aspect of cannabis potency when it comes to growing!
Your plant genetics set the "upper limit" of how much THC and other cannabinoids your plant will ever be able to produce. Although you can use grow methods to maximize the THC within that limit, you will never be able to overcome the limits set by your strain and plant genetics.

So as a really rough example, let's say your strain/plant genetics can only produce 20% THC at most. That means you may get less than 15% THC in your buds if you don't grow the plant right, but no matter what you do you'll never be able to increase it above 20%.

In order to get really high levels of potency and THC, it's essential to start with high-potency, high-THC genes from a respectable breeder. Learn how to research strains so you get the most potent cannabis plant to fulfill your needs. If you've never ordered cannabis seeds before, learn how to get seeds delivered to the US and worldwide.

Some strains just don't have the genetics to make cannabis buds as potent and trichome-covered as the Pineapple Chunk buds pictured here. Unfortunately, there's nothing you can do to beat genetics. Start with good genes.

Harvest Time

Many cannabis growers don't realize they are harvesting their buds too early, dramatically reducing yields and potency!

There is a 2-3 week period during the flowering stage when plants are "mature" and buds are at the highest levels of THC. At this point, the tiny resin glands (trichomes) on the buds have turned milky white, and most of the white hairs (pistils) on the buds have darkened and curled in.

Highest Level of THC When...
Most white pistils have darkened and curled in (bud looks "solid" instead of fluffy)

If you look at the buds under a magnifier, they have the highest THC when most of the "heads" of the trichomes have turned milky white.

If you harvest earlier, the plant hasn't reached its full potential. Sometimes early-harvested buds can produce a "speedy" effects, or give some people headaches (curing will help with this) so avoid harvesting early if you can.
If the plant is allowed to keep maturing past the "done" point, the cannabinoid profile continues to change in the buds. Buds harvested on the later side tend to produce more of a relaxed "body" effect, though the psychoactive effects of THC may be somewhat reduced. If they're allowed to go too long, eventually buds lose a ton of their potency.

Here's a quick cheat sheet

Learn more about when to harvest cannabis (with lots more pics!) Get the effects you're looking for.
This cola has several weeks to go before it reaches its highest THC levels – harvesting now will reduce both your yields and your potency!

Plant Health & Care While Buds Form

In order to get your cannabis to produce the most potent buds possible, you need a robust, healthy cannabis plant with lots of bud sites getting direct light during the flowering stage. This means it's important to avoid common plant health mistakes like overwatering, underwatering, heat stress, root problems, irregular light cycles, and nutrient problems. Check out our 7-step remedy to fix most cannabis plant growing problems. Try to maintain balance and avoid environmental extremes. Basically, treat your cannabis plant like it's a celebrity – it gets everything it wants!

Green healthy leaves are always a great sign

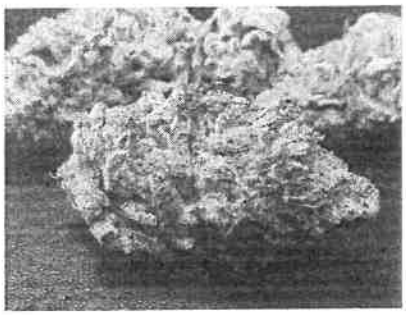
Keeping plants healthy while preventing the grow space from getting **too hot or humid** during the second half of the flowering stage will greatly increase your overall bud quality and help maximize THC levels.

Light Levels

Although cannabis can grow in relatively low light conditions (it grows like a weed!), it will not produce significant amounts of bud without very bright light in the flowering stage. Cannabis uses light to power the growth of buds, along with the THC and cannabinoids contained inside. Outdoors your plant needs direct sunlight to produce to its fullest, and indoors you need strong, bright grow lights (like LEDs, LECs, or MH/HPS grow lights) to produce the highest levels of THC.

I love doing side-by-side grow tests between different types of light and then getting the buds lab tested to see the effects on terpenes and potency. So far, the HLG 300 R-Spec LED has produced the highest THC of all the LEDs I've tested. Although the yields were below average (harvest pictured here), it produced some of the highest quality buds I've ever grown. I'm actually growing with two R-Specs right now, and will report the cannabinoid results from this newest batch in a few weeks. My impression so far is (again) that they are low-yielding compared to other LEDs, but the bud quality looks astounding.

These Mandarin Cookies buds were listed as producing 25% THC. They produced the listed amount under grow lights but tested at 27% THC under the HLG 300. Several other clones from the grow also tested at higher THC than expected. This was only one grow comparison with lab results so far, but I think it's safe to say that the HLG R-Spec seems to be the most "THC-increasing" grow light I've tried.



Curing Process

Although there is no evidence that the curing process (jarring up buds after they've dried) increases THC levels directly, there is a lot of evidence that it increases the *perceived* potency of buds.

Chemical changes that happen during the curing phase seem to affect and "intensify" the effects of THC and other cannabinoids.

The curing process also has other benefits for marijuana growers. For example, cannabis buds that get dried poorly may smell like cut grass or hay, even if the buds smelled great in the flowering stage. The curing process helps get rid of the unpleasant grassy taste/smell and brings back the natural taste and smell of the cannabis plant.

Lastly, uncured and early-harvested buds can cause "speedy" thoughts or headaches for some people, and curing often reduces these negative effects.

Learn about other ways to increase bud quality

Common Myth: Using CO2 increases THC levels

Although it's true that using CO2 can increase your overall cannabis *yields*, there isn't any evidence that it actually increases the *potency* of your bud. Learn about other ways to increase yields.

Unknowns: These Growing Methods May Increase THC But Aren't Well-Tested

These are some of the common ways growers try to increase the THC levels of their cannabis. These techniques and methods are considered "unknowns" because there hasn't been a whole lot of scientific testing to see what works and what doesn't work as far as increasing THC.

- Supplements
- Veg Plant for 8+ Weeks
- Lack of Pollination
- Grow Light Spectrum
- Special Ways of Flushing

Supplements to Increase THC and Overall Potency

There are many supplements for growing cannabis, and each one has a different purpose. Some supplements are great, while others are just snake oil.

When it comes to supplements for bud quality, most claim to increase yields or flavor as opposed to potency. However, there are some supplements that either claim or insinuate that they will increase the potency and/or THC levels in your cannabis.

Unfortunately, at this time there aren't any supplement companies that have conducted systematic tests showing that their supplements will actually increase THC. Because of this, although it seems possible that some of these do work as stated, I can't recommend any ones in particular.

Learn more about how cannabis nutrients and supplements affect bud quality

If you know of any supplement manufacturers who have tested their products on real cannabis plants and can demonstrate that their supplements actually increase THC, we'd love to hear from you!

Allow Plant to Remain in Vegetative Stage For 8+ Weeks

I've heard this one from different growers over the years, but for now, the jury is still out. The idea is that a cannabis plant needs to remain in the vegetative stage for at least 8 weeks after germination before being switched to the flowering stage in order to reach its maximum THC levels when it starts budding.

Cannabis plants that have been allowed to grow for at least 8 weeks in the vegetative stage tend to be much bigger and more robust than plants switched earlier, and they produce far greater yields. But does that mean that they produce higher levels of THC? It seems like it could be possible, but it might also be related to other factors. For example, big plants are usually grown under powerful grow lights, which affects potency, and are also often grown by more experienced growers. More testing is needed!

My idea for a test (hopefully someday I'll get to do this when I get more room to grow more plants at once)

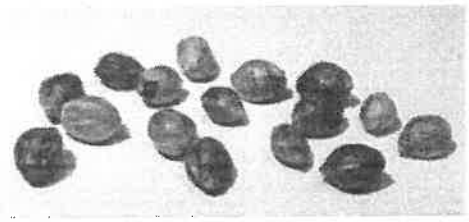
1. Sprout several seeds from a very stable cannabis strain like Northern Light to reduce genetic variation between the plants
2. Allow each seedling to grow out to 8 weeks in the vegetative stage, then take a few clones off each plant. Although clones are the size of seedlings, they are the same internal "age" as their mother so in a way, these clones would already be 8 weeks old
3. Sprout more seeds of the same stable strain and grow them until they're about 3 weeks old so they're the same size as the clones. You want to time this so that the seedlings are about 3 weeks old just as the clones are the same size and taking root. Seedlings can't start flowering before 3-4 weeks old and we're trying to create as close to the same conditions as we can between the two plants to reduce as many variables as possible.
4. Now that you've got your 3-week seedlings and your "8-week" clones that are the same size, flower them together in the same conditions.
5. After harvest, test the THC levels! If the buds from the clones are consistently more potent than the ones from the seedlings I'd say it's pretty good evidence that increased age increases potency. If not, well, back to the drawing board to try another test.

Letting plants get older before the switch to the flowering stage definitely results in bigger plants and higher yields, but we don't know if it increases cannabis potency

Lack of Pollination (Producing "Sinsemilla")

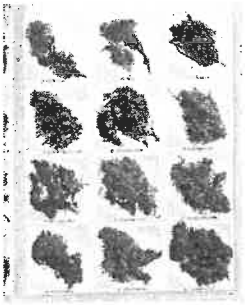
Just a few decades ago pretty much all cannabis bud you could find was full of seeds. This is because at the time many growers didn't realize that male and female cannabis plants need to be separated in the flowering stage to prevent the female plants from getting pollinated and making seeds.
However, once cannabis growers became more aware of growing techniques including how to prevent pollination, there was a rise in "sinsemilla" weed, a word which combines the Spanish word "sin" (without) and "semilla" (seed) to mean cannabis "without seeds."

Seeds belong in your garden, not in your buds



The sinsemilla bud that started flooding the market was much higher potency than the seedy, low-quality bud that had been available before. This led to the term *sinsemilla* being used to describe very high-quality and potent cannabis. There's no doubt that most growers prefer buds without seeds, but the term sinsemilla has led to the idea that cannabis buds without seeds were inherently more potent than seedy bud.
While this may very well be true, there isn't much evidence that it's actually the lack of pollination which caused the dramatic increase of potency experienced by cannabis enthusiasts at the time. Right around the time growers started producing non-seedy buds, the cannabis breeding scene was also starting to get established. Publications to assist cannabis growers like the *High Times* magazine appeared on the scene to help growers learn better growing techniques, and cannabis breeders like Nirvana started shipping cannabis seeds of famous strains to growers all around the world by mail order.

High Times Top Strains of 1977



Growing and breeding techniques were improving simultaneously. It's possible that the increase in potency experienced by people who switched to seedless buds was actually the result of better genetics/breeding. These days, most people only get sinsemilla and no one really wants to do direct comparisons.

However, keeping buds from producing seeds *will* dramatically increase the perceived quality of your buds, as well as your yields, so regardless of whether it increases bud potency or not, it's something every grower wants to do. Don't let your female plants get pollinated – remove all male plants from your grow room immediately (or start with feminized seeds, which don't produce any male plants).

Type of Grow Light & Spectrum – HPS, LED & LEC Grow Lights

Different types of grow light produce different spectrums (colors) of light. There are some growers that believe that growing cannabis under the unique light spectrums of LED grow lights or LEC grow lights may increase resin production and THC levels. Other growers swear that you need powerful HPS grow lights to produce the highest levels of THC.

I don't think anyone has yet discovered the "perfect spectrum" but some LEDs are certainly getting better bud quality than others.

Like I mentioned earlier, the HLG 300 R-Spec LED is the only grow light so far I've seen that seems to be able to actually increase THC levels in lab tests between clones. More testing coming soon!

Special Ways of Treating Plant Just Before Harvest

During the flushing process of growing cannabis, a grower generally gives their plants just plain water for the last few weeks before harvest. This is done to encourage the cannabis to "cannibalize" itself and use up all remaining nutrients in the plant. The idea is to get the plant to use up any nutrients that may have built up in the buds which could possibly affect that taste/smell after harvest

However, there are several additional types of flushes that many growers believe will increase THC levels. Most of these are done in addition to regular flushing, just before harvest. Unfortunately, there aren't many (if any) tests determining which one of these work, but there are many experienced growers who swear by these methods/

Unfortunately, they don't all match (for example some growers say to harvest in the morning, while others believe you get more THC if you harvest during the plant's dark period), but these are the most common flushing techniques that I've heard to increase THC levels right before harvest.

These "flushing" methods may (or may not) increase THC:

- keep plant in the dark for 2-3 days before harvest
- harvest cannabis in the morning
- harvest cannabis during the plant's dark period
- water plants with ice water before harvest
- chop down and hang entire plant upside down for a few days before trimming and drying buds

Conclusion: Time to Grow More Potent Cannabis!

There are certain techniques that will *definitely* maximize the THC produced by your cannabis, and there are other methods that *may* increase potency but their effects are less certain.

If you are serious about increasing the THC levels in your cannabis, make sure to follow the top steps which are *known* to increase potency. Skipping any of those steps will reduce your potency for certain. You will always produce high-THC bud as long as you choose the right strain, give plenty of bright light, take great care of your plants while they're alive, and harvest/dry/cure your buds.

But luckily for cannabis growers, most of the "unknowns" can't hurt your plants, so there's no harm in trying them out, too.

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How to Increase Marijuana Yields
How to Increase Overall Bud Appeal
How long does it take to grow and harvest weed?
10 Steps to Start Growing Cannabis Today!