

Objections To The Double Deep

By Walt Wright

Over the years, this maverick beekeeper has injected his dislike of the double deep wintering configuration in different articles, sometimes by innuendo, and sometimes by a flat statement. The intent of this article is to compile all those reasons into one place to help beginners make a rational decision when starting out. I am dismayed at the number of beginners who set out to fill two deeps on their first colony. I would like to head them off for the simple reason that once they start down that road, changing direction is much more difficult. This discussion is not directed to those beekeepers addicted to the double deep – they are not going to change – it's all they know. If they see the following “problems” with the double deep (DD), they are considered normal and are taken in stride. I wouldn't change either under those circumstances. The surge in lady beekeepers is all the more reason. The ladies, both old and young, can have less muscle power than that necessary to cope with a deep of honey. In today's beekeeping, access to the brood chamber is mandatory.



Weight is a good place to start. It's something you can see and feel. Shouldn't get much argument there. Back problems are almost a given with long-time beekeepers. There's good reason for that. You can't lift the deep of honey from behind the stand with your legs as recommended by the orthopedic folks. Then when you lift it, you need to turn one way or the other with it to set it down. The old back is not designed for that kind of abuse. And the fingertip grip doesn't help. If I'm going to lift a deep of honey, one hand at a time gets a good grip on the bottom of the box before lifting. It's still not easy, but I don't worry about dropping it. There are ways to improve the hand-holds, but that doesn't do much for the basic weight problem.

There is a movement of beginners who get their guidance from internet sources, to using all mediums – both brood chambers and honey supers, all the same depth. The practical advantages are less weight of brood chamber honey and the interchangeability of frames. One size fits all.

I recommend a hybrid intermediate between the double deep and all mediums. My overwinter configuration is a single deep for the basic brood chamber and the rest all shallows, both upper brood nest and honey supers. Selection of this configuration was not an accident. The bee's preferences and instincts drove me there. This article is intended to describe those considerations.

To understand the weight of a typical deep brood chamber, it's important that you recognize that cell usage affects the total weight. The following descriptions provide an introduction to cell weight in ascending order.

Open brood, including the cell turn-around time of prep for the next cycle of eggs, is the least heavy. Even if the cell is occupied by an upended adult cleaning or feeding, it weighs less than any cell with stores at static levels. Cells are almost empty.

Bee bread and capped brood are in the same range of cell weight. Long-term pollen (bee bread) does not fill cells to brood-rearing depth, and the mature larva has been fattened for the capped period.

Fresh pollen for feed is normally filled to brood-rearing cell depth and is roughly equal to feed nectar in weight. Nectar is lighter than cured honey and fresh pollen is not “pickled” for preservation, and therefore less dense.

Capped honey is heavier than any of the above. By far! With cells extended from brood-rearing depth to honey-capping depth and the moisture removed from the nectar, there is little comparison with the cells

used for other purposes. All this to point out that a deep of honey may weigh twice the deep dedicated to brood.

Do we need to contend with handling a deep of honey? The answer is no. Two shallows of honey contain almost exactly the honey weight as a deep.

I have no “scientific” data to support the above general observations, but those of you with means to test them have the option to confirm or refute. Seat-of-the-pants observations are my trademark. I am not a scientist and make no excuses for that. Just another beekeeper – passing on what I see.

Back to the weight thing: The typical brood box has a frame of reserve honey on the outside, a frame of feed pollen in the next slot in. Depending on where we are in the brood in the active season, the ratio of cells for brood is constantly changing: brood increases in spring; decreases main flow through summer; increases in early fall; and ending with total close-out in late fall. At no time does weight of the basic brood nest deep approach the weight of a full deep of capped honey.

The weight of a deep of honey should be enough reason for anyone to avoid the double deep, but it was not the reason that I shifted away from that configuration. Interpretation of colony preferences and prejudices was the main reason. It helped to have some “feel” for the colony season long survival format and how they went about implementing the survival requirements. That info is generally not included in beginner’s books or introductory courses.

To get into the nuances of my reservations about the double deep, it seems appropriate to restate some relevant observations that have not achieved general acceptance. It might be more accurate to say that they might never be accepted, but that is not justification for abandoning the concepts.

1. The bees have a prejudice against the break in functional comb at Langstroth box joints. The gap in comb of more than an inch is unlike the continuous comb of their wild nest and disrupts their instinctive comb usage patterns.

2. The colony queen does not make the judgments on where and when to deposit eggs. Recognize that the cells need to be prepared for eggs. Preparation for eggs is done by the workers. The queen doesn’t get a vote. Her judgments are limited to whether or not to lay a fertilized egg in the cells to which she has been directed. Her major contribution to implementing control functions is being the repository for worker genetics, and she yields to collective worker judgments. By “control functions” we mean the day-to-day internal operations of the colony such as expansion or contractions of the brood nest

3. The colony has a distinct preference for rearing brood on the deeper frames of the deep box, when the option is a shallow. In a medium depth box the preference is not as acute. I am aware that a medium is only a difference of an inch comb height, but nobody knows how the bees “think”. I try to report what I see. Permitted to do it their way, and wintering in the lower deeps, the early spring build up expands the brood nest into the upper. Depending on colony strength, brood volume decrease begins either during the swarm prep period or a few weeks later at reproductive cut off. Nectar is stored raw during the backfilling of the brood nest to brood-rearing depth. At “main flow” the cells are extended to honey capping depth and promptly capped. The raw nectar has been curing by brood nest heat rise during the period of swarm prep through “main flow”. All this to point out that in my area, typically there is only a couple months out of twelve that the upper deep is not at its full capped honey weight. In today’s beekeeping, where periodic brood nest inspection is mandatory on a regular basis, that’s a lot of grunt work.

Spring

The overwintered colony’s primary objective is to generate a reproductive swarm in the early active season. Without going into all the details, the double deep colony that winters in the lower, expands into about half of the upper. A dome shaped addition reaches nearly to the top bars at the top of the upper

then swarm preps start. The DD with brood cluster in the top and a basically empty lower is reversed early. Reversal of an empty gets their brood volume up to 1 ½ deeps quicker – they didn't have to consume the honey for brood nest expansion. Reaching the expansion limit sooner helps them meet swarm requirements. Swarm prevention in the DD is difficult. In either case above, when the colony reaches the 1 ½ deeps brood volume, they shift to swarm preps and start brood nest reduction by backfilling with nectar at the top. Options open to the beekeeper are periodic reversal, or adding yet another deep of comb at the top to break up the honey reserve that limits expansion and starts swarm prep.

There are at least three attendant problems with reversal for swarm prevention. First, the colony does not generally build more than the 1 ½ deeps of brood. When the lower with brood to the top bars is raised, the colony starts over with brood nest reduction at the top. That delays meeting the backfilling requirement and commitment to swarm by starting swarm cells. Although that delay is a deterrent to reproductive swarming, it also tends to overpopulate. The second adverse effect is that the colony deprived of their normal brood nest reduction in the swarm prep period gets overcrowded and generates a later swarm to relieve the congestion. Early supering with drawn comb will often relieve the overcrowding condition.

The third item is not related to swarming. It doesn't matter whether they backfilled their upper deep with nectar and swarmed or were periodically reversed, they seldom get the natural pollen reserve stored below the brood nest. It's no problem on the continuous comb of the wild brood nest, but you won't see much of it in the DD. The pollen reserve is long-term stored pollen (bee bread) that is used to support the fall build up starting in August. Fresh pollen is scarce in most areas at that time, and not having the reserve in place handicaps fall preps. The colony winters better if the pollen reserve was stored in the early season. That is more important in northern areas where fall descends earlier.

An under-recognized feature of the DD is that the colony that backfills the upper deep in the early season accumulates less surplus honey. Surplus honey is just that. It's the difference between colony needs and colony capability. When the colony backfills the survival needs of nectar accumulation in the swarm prep period, their motivation is reduced and continued brood nest reduction is evidence of that "complacency". Having met survival requirements, the emphasis shifts to population reduction to reduce the erosion of stores by excess consumption.

We all know that the swarmed colony produces minimal surplus. An element of the swarm process is provisioning the parent colony by backfilling part of the expanded brood nest. If they were conscientious employees hired to make honey for you, they could make up the personnel loss of the repro swarm in a single brood cycle. But they are motivated by survival. The honey production loss is not so much because they lost the bees to the swarm, but because the emphasis shifts to preservation of the stores – rear less bees. If the swarm process has been interrupted by reproductive cut off, the brood nest reduction may have been in process and the above still applies. The production decrease is just impacted somewhat less. Repro c/o was described in an article in April of '03 on Survival Traits.

Midsummer

Locally, this period is harvest time for the beekeeper and adjustment time for the bee colony. The beekeeper in a beetle area needs to process his honey as quickly as possible to prevent damage.

The colony needs to reorganize for less population and brood nest consolidation. A whole article was devoted to brood nest consolidation, Evils of the DD (Nov 03). As noted in the lead-in above, this submittal is to collect those problems and not to rehash them. Briefly, the colony needs to organize the brood nest into one brood chamber or the other to prepare for fall preps. They don't want the brood nest spanning the gap in comb between the two chambers. Selection of which deep to prepare is not a problem if the upper was filled during the main flow with capped honey or the lower contains mostly bee bread – most of the brood is automatically in the other. The problem is more severe where both chambers contain scattered brood, honey, and pollen. Scattered comb usage is okay in warm weather, but fall and

clustering is coming – time to select which chamber and get it prepared. Note that seasonal flow patterns or hive body reversal can contribute to scattered use of both deeps. Also note that whichever box they choose to establish the wintering nest in, the fall brood nest will be impacted by frames of irregular content.

Fall

The bees do not use our calendar to govern activities. Fall build up to rear young wintering bees starts in early August – more than a month ahead of Autumn on my calendar. Their processes are slow and methodical and the early brood nest expansion can easily go unnoticed by the beekeeper, but become more obvious in September. The typical late September brood nest is nearly a full deep of brood. Having struggled to get to this point in the DD, now it's time to change directions in October. Gradual brood nest reduction to the close-out is the order of the day. Some problems develop in this period.

In my area where the climate and forage are similar to Europe, the colony normally gets the brood nest prepared for winter by backfilling the brood cells with nectar during closeout. They need underfoot fuel for early winter clustering. Only two seasons in twenty did they need feeding in late fall to get the brood nest properly backfilled.

In more northerly areas, where clustering weather comes while there is significant brood volume, frosting out of forage doesn't let them get it done. The cluster is not going to try to winter over empty cells. Their only recourse is to relocate the cluster up into the upper deep in early winter. The northern beekeeper is certain they ate their way up there. I doubt that. But then, I'm a southern crackpot. What do I know?

So, how does the DD influence the above scenario? Glad you asked. First, recognize that colony aversion to spanning the gap in comb with the wintering cluster is a very real thing. (Only an observation on my part and automatically suspect.) In the wild brood nest on continuous comb the colony does not have to relocate upstairs. They only have to shift upward a little to enfold overhead capped honey in the warmed cluster interior. They can migrate the cluster upward as the need dictates. The break in functional comb between boxes of the DD interferes in the process, and that prompts the relocation. Radical, no?

Another fall problem with the DD is the reluctance of the colony to move the established brood nest down into the lower box on the fall flow. Key word: "established". The colony that has been getting the upper deep set up for the winter for a month or two is fairly well committed to wintering in the upper. Reluctance to "jump the gap" at the interbar area contributes some to remaining in the upper. The northern beekeeper, interested in acquiring fall honey adds another factor. With honey accumulation in supers above the DD, the colony has a false sense of security. They have no way of knowing that the overhead honey is going to be removed. The result of harvesting fall honey is that the colony goes into winter without adequate overhead honey reserve and an almost empty lower deep. They are at the mercy of late fall syrup feeding. Most can survive a long winter if the brood nest is full, backfilled with heavy syrup.

The section on wintering in the Dadant "Bible" provides the note that there has not been much improvement in wintering losses over the years. Can you postulate from the above that perhaps not supporting colony instincts could be a major contributor to known losses? The writer hasn't had a winter loss in 10 years. Not only no losses but no weaklings in the spring. I must be doing something right.

Having overrun Editor Kim's guidelines for article length and aware that he doesn't like multiple part articles, I must close this out. In my opinion my wintering configuration is better than the double deep. For those of you on the fence, look for the above indications in your hives. You may come to the same conclusions and decide you are not happy with the double deep.

The referenced articles and a description of my wintering configuration can be found at www.beesource.com click on Point of View.

We can't reasonably close this out without identifying some of the advantages of a single deep and the rest shallows. Some all-season notes will be followed by some seasonal specifics.

All Season

The brood nest is maintained for the full active season in the basic brood nest deep. The colony preference for rearing brood in a deep anchors the brood nest there and insures that you will know where to find the brood at any time. That's handy for inspection, medication, leaving wintering honey, etc. In contrast, the all-medium stack often causes the brood nest to climb into what should be honey supers, leaving empty comb at the bottom.

With a simple manipulation in the early season (moving a shallow of brood to the bottom board) you can insure storing of the pollen reserve. That maneuver supports fall build up and improves wintering.

The commercial operator who has a vested interest in shipping compact hives on a semi typically uses DD. He could easily substitute two shallows for the extra deep, and only gain a few inches in height of the layer stacks.

Spring

Swarm prevention is simplified. The two shallows of reserve honey overhead provide more flexibility for opening up the overhead honey reserve to prevent swarming.

Colony build up does not seem to be impeded by shallows overhead. The colony is driven by the urge to reproduce. In my area, they often achieve the equivalent of three deeps of brood (1 deep and 4 shallows.) During the "main flow", the brood nest recedes down through the shallows by backfilling toward the basic deep. In contrast the DD seldom has more brood than 1 ½ deeps. Checkerboarding encourages more brood, bees, and honey.

Midseason

No problems with colony indecision on locations of the brood nest. If you want maximum harvest you can take the capped and leave them the partial or unfinished frames for feed. Easy to consolidate with shallows. Just leave them sufficient honey to maintain brood through the period.

Fall

You have but to confirm in late fall that the brood nest deep gets properly backfilled for winter at brood nest closeout. If not, feed through brood nest closeout.

Conclusion

As you can see from the above cryptic comments, most of my reservations about the double deep are offset by simply replacing the upper deep with two shallows. Costs a little more in up-front woodenware, but the benefits go on and on. I normally get nearly twice the honey in the tanks as standard management where colonies are overwintered in double deeps. This extra production is the result of yielding to colony instincts and preferences. In short: the double deep comes in third (bronze) behind all mediums (silver) and single deep and shallows (gold). Take it from there.