A MANAGEMENT SYSTEM FOR THE NEW A-FRAME BEEHIVE

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IN RECENT publications which describe the new modular A-frame beehive[1,2] several advantages over presently available equipment were anticipated, especially: 1) the elimination of heavy lifting; 2) simplified use of the two-queen system; and 3) improved comb honey production. Direct accessibility to all hive bodies while in place, evident upon examination of Figures 1 and 2, is the most significant single feature of the A-frame construction contributing to these expectations.

This report describes a management system for evaluating expected gains, and records performance in four A-frame hives from early spring through the fall of 1978. The A-frame hives used were constructed according to previous disclosure,[2] except that the slatted grid with 3/8" slots which connects the triangular end pieces of each module is interchangeable with a queen excluder grid while the modules are stacked. The queen excluder grid as shown in hand in Fig. 1 resembles the conventional 3-wire queen excluder.

The system used is outlined schematically in Fig. 3.

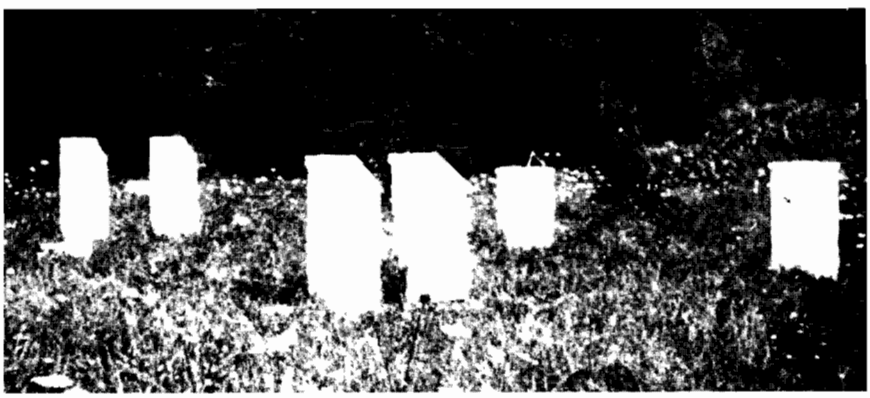
Colonies for this experiment were started in the spring with packages and queens from the south rather than overwintered colonies in two hive bodies, as would be the normal practice. Two-pound packages were introduced on April 6, 1978 into four double A-frame hive (I in Fig. 3), each with 20 drawn triangular brood frames containing some honey and pollen. There was no further feeding.

On May 6 during the fruit and dandelion flow an empty module[3] with queen excluder as the grid was placed on the top of each double brood chamber hive after top and side covers were removed (see II in Fig. 3). Three frames of sealed brood with bees but without queen were selected and placed above in the empty hive body[3] along with enough broodless combs to complete the full complement of ten. All of the remaining brood combs and the queen were placed below in 1 (now III, Fig. 3). Ripe queen cells, obtained from a local breeder,[3] were introduced at this same time into each top chamber.[3] After replacing the covers and providing an upper entrance to module 3, no further attention was required until the main honey flow. The empty supers[2] and the queen excluder under the upper brood chamber[3] served successfully to separate the two queens and to provide cluster space. In the event the bees are ready to start comb building from minor honey flows preceding the main flow, frames for that purpose can be readily provided in the empty hive body.[2] A queen excluder can be inserted if needed into module 2 directly over brood chamber 1.

On July 3, shortly after the beginning of the main summer flow, all four hives appeared strong and approximately equal in bees and brood. The older queens in each lower brood chamber[1] were removed and stored elsewhere in preparation for reuniting the two brood chambers. After this point, while all side and top covers were still detached, alternate plans were followed in order to evaluate the merits of top supering (plan A) and bottom supering (plan B), each plan with two of the hives.

Only the first plan (A) is shown in Fig. 3. This involved the manipulation of arrangements from III to II to IV. Thus, brood combs from position 3 (of III, Fig. 3) were individually removed, inspected for the presence and quality of the newer queen, and returned below to position 2. This maneuver reconstitutes the single double chambered brood nest (arrangement II) with a single new queen below the queen excluder. Another super was placed on top (position 4) to complete arrangement IV. Frames containing triangular sections with foundation, or just started stripes of foundation, were now placed in supers 3 and 4 above the excluder. Triangular dividers of 1/8" masonite, pictured in Fig. 4, were used to separate the frames. Additional space for surplus honey can be provided as needed throughout the remainder of the season by top supering. The upper entrances were closed.

The second plan (B), devised to evaluate bottom supering, is the inverse of plan A. Thus, a fourth module was first placed on top of arrangement III, and the queenless brood of 1 transferred upward to the new position 4.



Apiary Picture: View of paired A-frame hives in the author's apiary in midsummer of 1978.

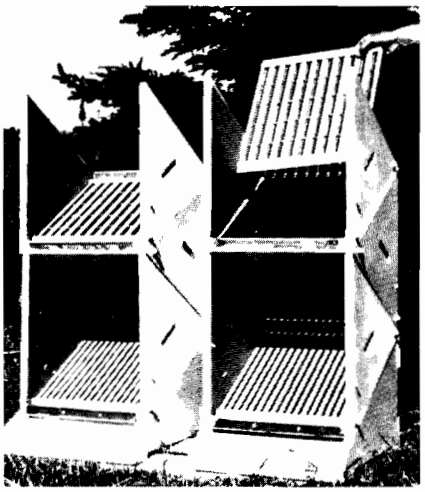


Figure 1: A pair of three-module stacked A-frame hives without covers and frames.

Figure 2: Inspection of a bottom supered plan B hive during the main honey flow.

Figure 4: This photo shows the masonite separator as used between frames of comb honey sections.

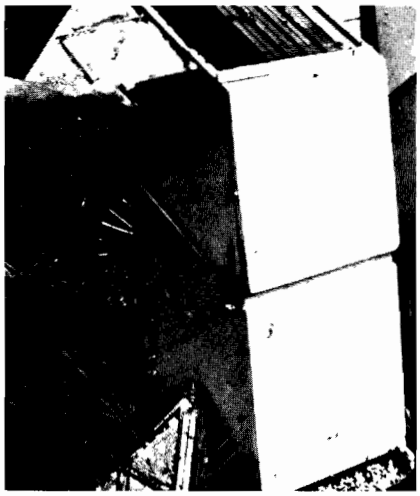


Figure 5: Inspection of top supered plan A hive (July 30).

The now empty positions 1 and 2 were provided frames for storage of surplus comb honey. Entrance was at the bottom.

All four colonies began immediately to draw comb in the surplus supers. After two weeks (July 16) the two top supered colonies of plan A had nearly filled the lower super 3 next to the brood, and the upper supers[4] were fully occupied with bees. By July 30 both of these plan A hives were ready for harvest (see Fig. 5). Each hive yielded seven frames, each containing four triangular comb honey sections, and seven frames containing full slabs for cut comb honey. Seven frames containing 9 smaller sized triangular sections with foundation were then placed in super 3 of each hive. By mid-August 10 finished or nearly finished frames of these smaller sections were harvested, after which no further late summer or fall surplus was produced. The individual small sections averaged ⅔ lb. each, the larger sections about 1¾ lbs., and the full frames were mostly at 7 lbs. each. The two plan A hives averaged 120 lbs. of comb honey (see Figs. 6 and 7). The bottom supered hives of plan B started comb building promptly in both surplus supers simultaneously, favoring the upper super[2] next to the brood. However, these bottom supered hives were not yet ready for harvest (see Fig. 2) upon inspection on July 30 when plan A hives were harvested. The brood chambers were severely honey bound with brood in only 4 to 5 frames of the lower chamber. A space with empty cells, presumably for brood, had been kept open below the

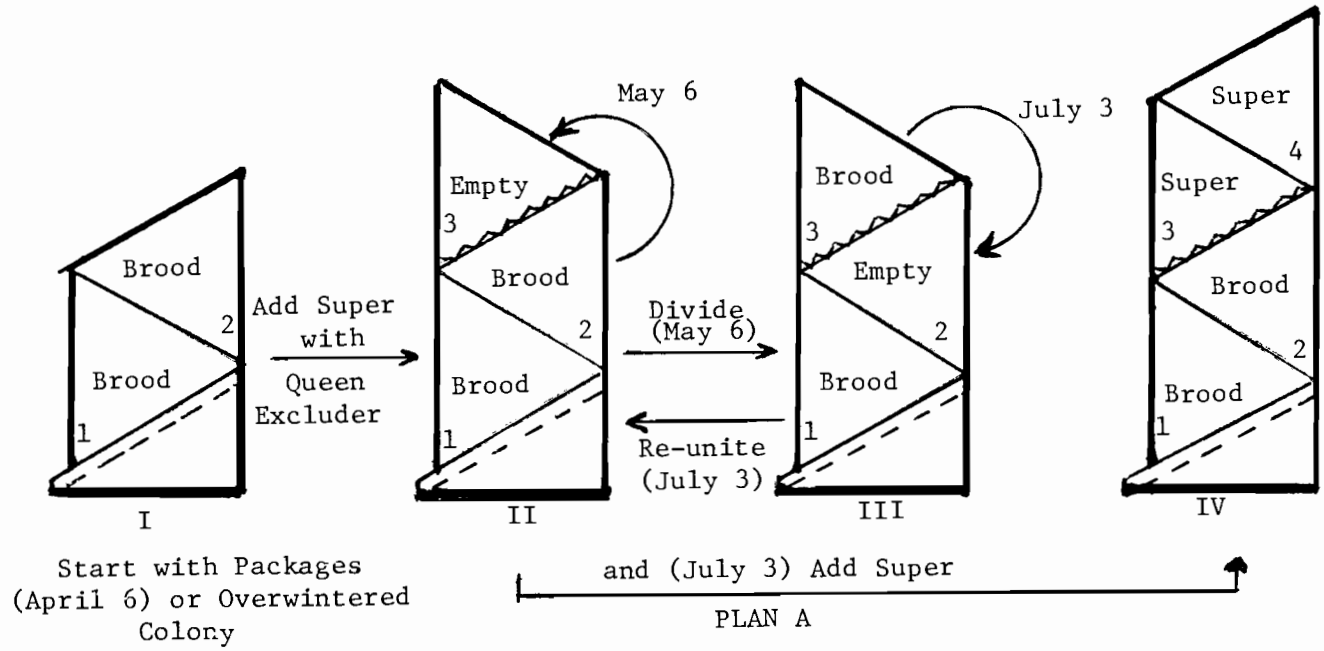


Figure 3: A-frame beehive management plan (A). The queen excluder is indicated by a serrated line.

queen excluder in the surplus super. That this circumstance would occur might well have been anticipated *a priori* had Langstroth's observation been heeded, to wit ". . . their instinct impels them always, if they can, to keep their stores of honey above the breeding cells." After nine days (August 8) 13 frames were harvested, about half as 1¾ lbs. sections and the remainder full frames of cut comb honey. The two plan B hives averaged 90 lbs. of comb honey. The frames in both brood chambers, shown exposed immediately after harvest in Fig. 8, were then transferred below to positions 1 and 2, the same arrangement now as in the plan A hives (i.e., IV, Fig. 3). No further surplus was obtained from the two plan B hives.

All four hives were prepared for the winter of 1978-79 simply by removing the top super now becoming arrangement II, Fig. 3. Then a wire screen was fitted into the base of module 3 over the queen excluder, but under 6 inches of fiberglass insulation cut to fit snugly.

After replacing top and side covers the hives are now fully prepared for winter. No top entrance was provided and the lower entrance was left fully open. The reader is reminded that mice cannot enter the hive beyond the ⅞" space between the bottom board and the grid of the lower module just above it, which has ⅜" slots for the egress and ingress of bees only (examine Fig. 1). This slatted grid also provides the same advantages that prompt the use of slatted bottom racks as separate pieces of equipment in conventional hives. Either brood chamber may be inspected during the winter or spring by opening the side cover; or the top brood chamber can be inspected also by lifting the entire top chamber, since it is an intact unit without much weight. With this summer management plan and wintering plan chamber 3 becomes a year around part of a three module hive which can be managed without the necessity at any time of moving any of these three modules.

The beekeeper experienced with present two queen management systems will recognize the substantial reduction of heavy lifting in this A-frame hive plan, and that the manipulations required are essentially equivalent to those involved in frame inspection and queen searching. In this experiment, plan A was significantly better than plan B as judged by the better performance in comb honey production and the lesser manipulation required from spring through to wintering status.

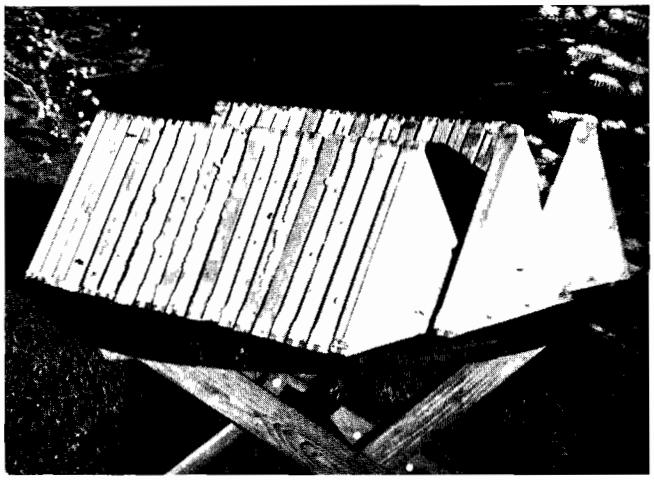


Figure 6: Total yield of comb honey from two plan A hives.

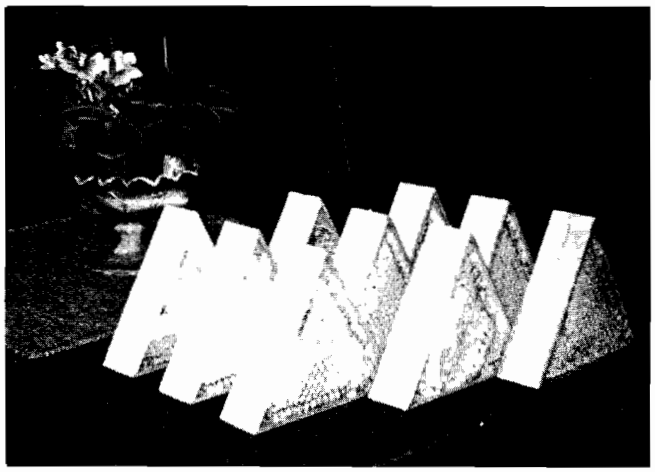


Figure 7: Nine triangular sections from one of the comb honey frames.

Several additional practices, not included in this experiment, are especially suited for A-frame hive construction and should allow for further simplication of manipulations and the optimization of field force at main honey flow: 1) the concept of open brood nest management[4] becomes practical with a two queen system by rotating extra empty brood combs into either or both of the two brood nests (III, Fig. 3) and using the empty chamber between for storing the withdrawn frames of sealed brood until hatched, to be recycled if desired; 2) feeding in the spring or fall can easily be carried out inside the empty chamber 3 of II, Fig. 3. The feeder pail is levelled with a properly sized wooden block on the low side of the sloping grid; and 3) a bee blower can be used to remove bees from frames in any hive body while in place at harvest time, or to remove queens by expulsion.

In summary, four A-frame hives yielded an average of 105 lbs. of honey in the comb (range 90 lbs. to 120 lbs.). The average yield per single queen colony in standard equipment for this area was reported to be about 70 lbs. of extracted honey. It is recognized that this experiment with four hives through a single season does not constitute a valid comparison. Nevertheless, considering the modest start from 2-lb. packages, these results suggest considerable promise for this two queen system of comb honey production in A-frame hives. All colonies were successfully requeened and there was no swarming. It is believed that in the A-frame beehive, managed as described, with two queens the potential is good for precise control of those factors which optimize peak field force at the time of the main honey flow, a condition essential to successful comb honey production. Additionally, quite in contrast to the reluctance of bees to enter conventional comb honey compartments, these supers with full size frames containing comb honey sections were quickly occupied and comb building was started at once. ●

REFERENCES

1. U.S. Patent 4133065, issued January 9, 1979.
2. **John A. Hogg, 1977.** An A-frame Modular Beehive. **American Bee Journal. 117**:8, 488-90.
3. Beeberry Apiary, Middleville, Michigan.
4. **W. J. Diehnelt, 1978.** Open Brood Nest Colony Management. **American Bee Journal. 118**:3, 183.