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INFLUENCE OF WOODACE BRIQUETTE PLACEMENT AND SIZE ON NITROGEN RELEASE

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Abstract. **Multiple branched *Rhododendron* L. sp. 'Mrs. G. G. Gerbing' liners were grown in a 2 pine bark: 1 Canadian peat: 1 sand (v/v/v) medium in 3-liter containers and fertilized with either three 16 g or eight 5 g Woodace briquettes (14N-1P-2K) per container. Briquettes were either placed in the growth medium surface (surface placement) or placed below the root ball (middle placement) of five containers for each briquette number and placement combination. Leachate nitrate (NO_3) concentrations ranged from 43 ppm on day 30 for the surface placement of the 5 g briquettes to 0.5 ppm on day 360. Nitrate concentrations were generally higher than NH_4 concentrations regardless of briquette placement. Azalea shoot dry weights and release rates for NO_3 and ammoniacal N (NH_4) were each similar regardless of briquette placement or size.**

Fuller and Meadows (2) determined that Woodace fertilizer briquettes (manufactured by Mitsubishi Chemical Industries LTD. of Japan and distributed by Estech, Inc., Chicago, Ill.) released N in a container medium for about a year when briquettes were placed in the surface. Yeager and Ingram (6) determined that 9% of the N remained in the briquettes after 300 days. The authors (3) also found that 'Mrs. G. G. Gerbing' azalea shoot growth was greatest when four 16 g briquettes were placed in the growth medium surface compared to middle or surface and middle placement. Leachate N levels were similar for the surface and middle placements during the 12 month study.

The following experiment was conducted to determine the influence of briquette size and placement on growth medium N levels and growth of 'Mrs. G. G. Gerbing' azalea.

Materials and Methods

Multiple branched liners of *Rhododendron* sp. 'Mrs. G. G. Gerbing' were potted 24 Apr. 1984 in a 2 pine bark: 1 Canadian peat: 1 sand (v/v/v) medium amended with 3 kg/m³ of superphosphate (9% P) and 1.8 kg/m³ of Perk (micronutrient formulation of Estech, Inc.). Three 16 g or eight 5 g briquettes were used per 3-liter container. The surface area for each 16 g and 5 g briquette was 36 and 13.1 cm², respectively. The briquettes contained 14% N, 1% P, 2% K, 2.3% Ca, 3.2% Mg, 2% S, 0.05% Cu, 1.1% Fe, 0.2% Mn, 0.005% Mo, and 0.08% Zn. The N carrier was isobutylidene diurea (IBDU). The briquettes of each size were placed either 1) in a circle 1.25 cm below the root ball (middle placement) of five plants or 2) protruding 1.25 cm from the growth medium surface periphery (surface placement) of five other containers. The plants were arranged in a completely randomized factorial design on black polypropylene ground cover under 30% light exclusion polypropylene shade cloth and received 1.25 cm of water applied as needed by Dramm drip rings.

Five additional plants were grown as described above except the medium was amended with 0.9 kg/m³ of Micromax micronutrient mix and 6 kg/m³ of Osmocote 18N-3P-10K (Sierra Chemical Co., Milpitas, CA 95035). Twelve g of Osmocote were surface applied to each container every 90 days.

Thirty, 60, 90, 150, 210, 270, 330, and 360 days after potting, 150 ml of distilled water were poured on the surface of each container and leachate collected (7). Leachate nitrate (NO_3) and ammoniacal N (NH_4) concentrations were determined by standard analyses (5). On 1 May 1985,

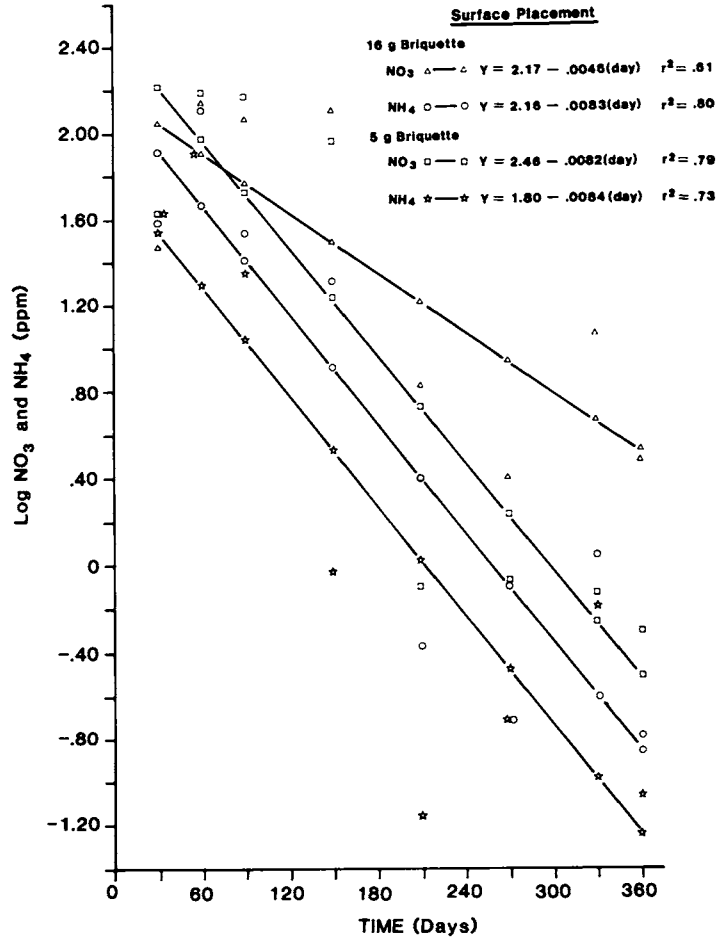

Fig. 1. Leachate NO_3 and NH_4 concentrations of a 2 pine bark: 1 Canadian peat: 1 sand (v/v/v) medium with three 16 g or eight 5 g Woodace briquettes (14N-1P-2K) placed in the surface of the container medium. Slopes are not statistically different.

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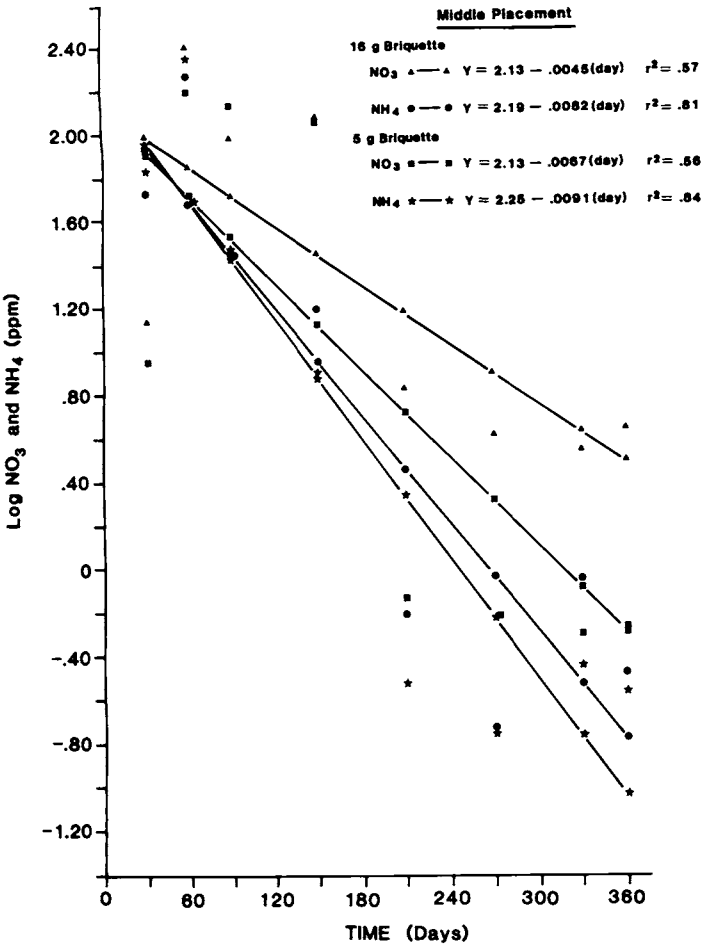

Fig. 2. Leachate NO_3 and NH_4 concentrations of a 2 pine bark: 1 Canadian peat: 1 sand (v/v/v) medium with three 16 g or eight 5 g Woodace briquettes (14N-1P-2K) placed in the middle of the container medium. Slopes are not statistically different.

stems of all plants were severed above the uppermost roots and shoot dry weights were determined after drying for 24 hr at 70° C.

Results and Discussion

Nitrate and NH_4 concentrations decreased during the experiment (Figs. 1 & 2) and each was generally greater for the 16 g than 5 g briquettes regardless of placement. The higher N levels for the 16 g than 5 g briquettes may have been due to more total N per container (6.7 vs 5.6 g, respectively), but the total surface area of 16 g and 5 g briquettes in each container was similar (108 vs 104.8 cm^2, respectively) and dissolution rates were not different. Nitrate concentrations ranged from 43 ppm on day 30 for the surface placement of the 5 g briquettes to 0.5 ppm on day 360. Leachate NO_3 levels for all treatments were less than 11 ppm after day 270. Even though these levels were lower

Table 1. Shoot dry weights of 'Mrs. G. G. Gerbing' azalea fertilized with three 16 g or eight 5 g Woodace briquettes (14N-1P-2K) placed either in the surface or middle of the container medium.

Briquette size[z]		Briquette placement[z]	
5 g	16 g	Surface	Middle
75.7 g	77.0 g	74.5 g	78.1 g

[z]Briquette size and placement were not statistically different (5% level) by ANOVA. Interactive effects were nonsignificant.

than previously observed (3), shoot dry weights were comparable to plants fertilized with Osmocote that had a mean shoot dry weight of 79.5 g. Leachate NO_3 levels for the Osmocote fertilized plants were 2.2 ppm on day 30 and 24.5 ppm on day 360.

Nitrate concentrations were generally higher than NH_4 concentrations, although NH_4 ranged from 68 ppm on day 30 for the middle placement of 5 g briquettes to 0.1 ppm on day 360 for the surface placement. The high NO_3 concentrations may have been due to nitrification (4) or retention of NH_4 by the pine bark (1). Nitrate and NH_4 dissolution rates for the same size briquettes were each similar regardless of placement.

There were no interactive effects on shoot dry weights and shoot dry weights were not different due to briquette size or placement (Table 1). In another study conducted by the authors (3), azalea shoot dry weights were slightly larger for surface placement of briquettes, however leachate NO_3 and NH_4 concentrations were similar for surface and middle placements.

These data indicate that azalea shoot dry weights and release rates of NO_3 and NH_4 were similar regardless of briquette size or placement. Thus, placement of briquettes in the container medium may depend on the potting system used by the nursery operator.

Literature Cited

1. Foster, W. J., R. D. Wright, M. M. Alley, and T. H. Yeager. 1983. Ammonium adsorption on a pine bark growing medium. J. Amer. Soc. Hort. Sci. 108(4):548-551.
2. Fuller, D. L. and W. A. Meadows. 1983. Leachate studies with several IBDU fertilizers. Proc. S. Nurserym. Assoc. Res. Conf. 28:67-70.
3. Ingram, D. L. and T. H. Yeager. 1986. Influence of fertilizer briquette placement and irrigation regime on container medium nutrient content and 'Mrs. G. G. Gerbing' azalea growth. J. Environ. Hort. (in press).
4. Niemiera, A. X. and R. D. Wright. 1986. The influence of nitrification on the medium solution and growth of holly, azalea, and juniper in a pine bark medium. J. Amer. Soc. Hort. Sci. 111(5):708-712.
5. Rhue, R. D. and G. Kidder. 1984. Procedures used by the IFAS extension soil testing laboratory and interpretation of results. Univ. Fla. Ext. Cir. 596.
6. Yeager, T. H. and D. L. Ingram. 1986. Growth response of azaleas to fertilizer tablets, superphosphate and dolomitic limestone. HortScience 21(1):101-103.
7. Yeager, T. H., R. D. Wright, and S. J. Donohue. 1983. Comparison of pour-through and saturated pine bark extract N, P, K and pH levels. J. Amer. Soc. Hort. Sci. 108(1):112-114.