N_m = Original RPM
N_p = New RPM
P_m = Original HP
P_p = New Hp
D_p = New diameter
D_m = Original diameter
Q_m = Original Flow
Q_p = New Flow

1) Convert thrust into Q_m

$$F = m \times a$$

$$m = \dot{\gamma}_w = (\gamma_w \times Q_m)$$

$$a = V = \frac{Q_m}{A}$$

$$F = \frac{(\gamma_w \times Q_m) \times Q_m}{\pi \times R^2}$$

$A = \pi \times r^2$

r = radius of Fin (Blade)

$$\boxed{F = \frac{\gamma_w \times Q_m^2}{\pi \times r^2}}$$

$$\boxed{Q_m = \sqrt{\frac{F(\pi \times r^2)}{\gamma_w}}}$$

2) Find Optimum Speed associated with D_m & D_p

$D_m = P_p$

$$N_p = N_m \left(\frac{Q_p}{Q_m}\right)\left(\frac{D_m}{D_p}\right)^3$$

$$N_p = N_m \left(\frac{Q_p}{Q_m}\right)$$

Assume Synchronous speed is less of equal to N_p then

$$P_p = P_m \left(\frac{N_p}{N_m}\right)^3 \left(\frac{D_p}{D_m}\right)^5$$